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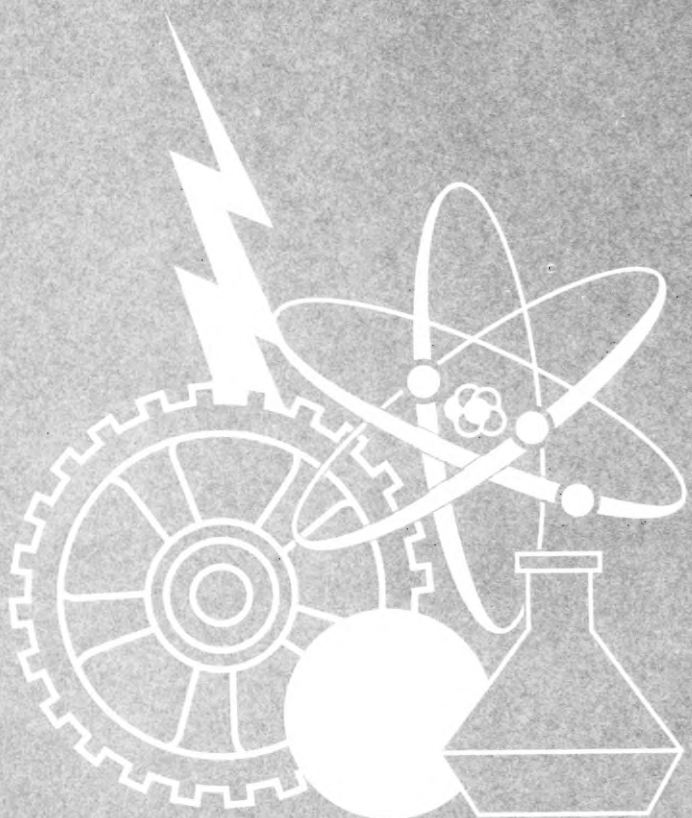
PATENTS

January 23, 1996



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

January 23, 1996 Volume 1182 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1181 O.G. 50, on December 19, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	660.00
—Corresponding prior U.S. national application filed	430.00
—Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1700.00
International fees	
Basic fee	677.00
Basic Supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
—For the first 11 national or regional offices designated	164.00
—For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
—Designation fee	164.00
—Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—USPTO was ISA in PCT Chapter I	470.00
—Additional examination fee, per additional invention (payable only upon invitation)	140.00
—USPTO was not ISA in PCT Chapter I	710.00
—Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
—All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
—Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
—Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
—For each independent claim in excess of 3	39.00	78.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	125.00	250.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 27, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 19, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,179,735 through 5,181,273
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 17, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,797,952 through 4,799,271
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 15, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,493,115 through 4,494,244
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED November 15, 1996
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,411	06/762,350	05/05/87
(4,415,705)	(06/399,643)	(11/15/83)
Re. 34,136	07/434,849	12/01/92
(4,705,783)	(06/748,489)	(11/10/87)
4,414,694	06/435,106	11/15/83
4,414,696	06/400,564	11/15/83
4,414,700	06/295,659	11/15/83
4,414,701	06/399,423	11/15/83
4,414,710	06/292,932	11/15/83
4,414,713	06/308,428	11/15/83
4,414,718	06/374,318	11/15/83
4,414,722	06/270,223	11/15/83
4,414,728	06/265,668	11/15/83
4,414,730	06/303,491	11/15/83
4,414,733	06/265,744	11/15/83
4,414,736	06/324,155	11/15/83
4,414,738	06/230,246	11/15/83
4,414,744	06/287,916	11/15/83
4,414,745	06/298,164	11/15/83
4,414,749	06/278,402	11/15/83
4,414,771	06/262,095	11/15/83
4,414,772	06/274,725	11/15/83
4,414,779	06/324,079	11/15/83
4,414,789	06/243,808	11/15/83
4,414,790	06/384,471	11/15/83
4,414,791	06/286,478	11/15/83
4,414,802	06/413,069	11/15/83
4,414,811	06/235,785	11/15/83
4,414,812	06/259,049	11/15/83
4,414,823	06/341,351	11/15/83
4,414,828	06/272,279	11/15/83
4,414,831	06/253,529	11/15/83
4,414,836	06/430,957	11/15/83
4,414,851	06/297,436	11/15/83
4,414,852	06/301,628	11/15/83
4,414,854	06/316,679	11/15/83
4,414,855	06/268,890	11/15/83
4,414,857	06/291,390	11/15/83
4,414,858	06/360,739	11/15/83
4,414,862	06/249,577	11/15/83
4,414,863	06/418,145	11/15/83
4,414,864	06/291,127	11/15/83
4,414,869	06/253,599	11/15/83
4,414,887	06/353,993	11/15/83
4,414,900	06/314,218	11/15/83
4,414,901	06/274,739	11/15/83
4,414,906	06/295,204	11/15/83
4,414,910	06/431,622	11/15/83
4,414,913	06/283,515	11/15/83
4,414,921	06/325,003	11/15/83
4,414,930	06/307,721	11/15/83
4,414,940	06/253,581	11/15/83

Patent Number	Serial Number	Issue Date
4,414,952	06/232,025	11/15/83
4,414,957	06/359,061	11/15/83
4,414,973	06/242,287	11/15/83
4,414,975	06/264,184	11/15/83
4,414,981	06/370,332	11/15/83
4,414,987	06/294,814	11/15/83
4,414,994	06/322,522	11/15/83
4,415,000	06/379,156	11/15/83
4,415,001	06/257,225	11/15/83
4,415,002	06/271,295	11/15/83
4,415,003	06/297,057	11/15/83
4,415,017	06/277,759	11/15/83
4,415,027	06/389,072	11/15/83
4,415,028	06/300,087	11/15/83
4,415,036	06/350,670	11/15/83
4,415,053	06/225,360	11/15/83
4,415,058	06/335,680	11/15/83
4,415,059	06/389,267	11/15/83
4,415,064	06/293,031	11/15/83
4,415,079	06/357,763	11/15/83
4,415,088	06/279,727	11/15/83
4,415,096	06/294,018	11/15/83
4,415,098	06/274,002	11/15/83
4,415,099	06/272,476	11/15/83
4,415,109	06/283,958	11/15/83
4,415,114	06/261,577	11/15/83
4,415,116	06/290,631	11/15/83
4,415,121	06/273,023	11/15/83
4,415,124	06/309,379	11/15/83
4,415,127	06/308,670	11/15/83
4,415,130	06/224,347	11/15/83
4,415,139	06/289,349	11/15/83
4,415,140	06/359,215	11/15/83
4,415,142	06/327,500	11/15/83
4,415,146	06/411,619	11/15/83
4,415,148	06/330,728	11/15/83
4,415,152	06/296,984	11/15/83
4,415,157	06/306,043	11/15/83
4,415,159	06/304,092	11/15/83
4,415,163	06/351,254	11/15/83
4,415,167	06/449,188	11/15/83
4,415,169	06/306,458	11/15/83
4,415,184	06/257,547	11/15/83
4,415,191	06/284,644	11/15/83
4,415,193	06/239,308	11/15/83
4,415,199	06/343,747	11/15/83
4,415,204	06/377,983	11/15/83
4,415,206	06/232,439	11/15/83
4,415,208	06/289,060	11/15/83
4,415,209	06/320,394	11/15/83
4,415,213	06/317,210	11/15/83
4,415,226	06/221,956	11/15/83
4,415,231	06/293,658	11/15/83
4,415,238	06/307,717	11/15/83
4,415,245	06/378,670	11/15/83
4,415,251	06/341,555	11/15/83
4,415,253	06/369,349	11/15/83
4,415,257	06/394,501	11/15/83
4,415,263	06/313,948	11/15/83
4,415,268	06/272,348	11/15/83
4,415,273	06/233,617	11/15/83
4,415,274	06/297,621	11/15/83
4,415,276	06/295,010	11/15/83
4,415,282	06/341,299	11/15/83
4,415,285	06/371,887	11/15/83
4,415,289	06/308,671	11/15/83
4,415,290	06/336,305	11/15/83
4,415,295	06/331,997	11/15/83
4,415,303	06/263,403	11/15/83
4,415,308	06/252,595	11/15/83
4,415,316	06/258,143	11/15/83
4,415,319	06/291,874	11/15/83
4,415,325	06/270,873	11/15/83
4,415,327	06/393,191	11/15/83
4,415,328	06/306,568	11/15/83
4,415,337	06/374,838	11/15/83
4,415,338	06/387,176	11/15/83
4,415,342	06/368,096	11/15/83
4,415,348	06/383,860	11/15/83
4,415,349	06/368,605	11/15/83
4,415,356	06/310,524	11/15/83
4,415,364	06/391,720	11/15/83
4,415,365	06/305,332	11/15/83
4,415,376	06/349,097	11/15/83
4,415,381	06/284,376	11/15/83
4,415,384	06/382,325	11/15/83
4,415,391	06/366,029	11/15/83
4,415,396	06/423,776	11/15/83
4,415,404	06/221,587	11/15/83
4,415,408	06/317,354	11/15/83
4,415,410	06/470,346	11/15/83
4,415,411	06/236,908	11/15/83
4,415,413	06/310,903	11/15/83
4,415,417	06/399,578	11/15/83
4,415,419	06/393,708	11/15/83
4,415,420	06/464,304	11/15/83
4,415,426	06/286,875	11/15/83
4,415,427	06/431,957	11/15/83
4,415,430	06/285,454	11/15/83
4,415,434	06/285,601	11/15/83
4,415,435	06/422,675	11/15/83
4,415,437	06/305,264	11/15/83
4,415,440	06/415,953	11/15/83
4,415,441	06/417,218	11/15/83
4,415,443	06/282,046	11/15/83
4,415,445	06/371,105	11/15/83
4,415,447	06/301,533	11/15/83
4,415,450	06/335,036	11/15/83
4,415,457	06/243,069	11/15/83
4,415,459	06/271,818	11/15/83
4,415,460	06/369,352	11/15/83
4,415,464	06/357,447	11/15/83
4,415,473	06/325,180	11/15/83
4,415,475	06/390,142	11/15/83
4,415,480	06/305,266	11/15/83
4,415,484	06/372,253	11/15/83
4,415,504	06/416,338	11/15/83
4,415,505	06/400,892	11/15/83
4,415,509	06/281,111	11/15/83
4,415,512	06/245,137	11/15/83
4,415,515	06/366,058	11/15/83
4,415,523	06/110,536	11/15/83
4,415,529	06/426,442	11/15/83
4,415,532	06/240,642	11/15/83
4,415,537	06/344,896	11/15/83
4,415,538	06/251,173	11/15/83
4,415,540	06/346,837	11/15/83
4,415,548	06/373,654	11/15/83
4,415,551	06/344,089	11/15/83
4,415,563	06/328,035	11/15/83
4,415,565	06/246,984	11/15/83
4,415,570	06/383,703	11/15/83
4,415,574	06/358,260	11/15/83
4,415,577	06/294,207	11/15/83
4,415,581	06/495,905	11/15/83
4,415,592	06/357,428	11/15/83
4,415,593	06/372,599	11/15/83
4,415,594	06/335,495	11/15/83
4,415,595	06/324,406	11/15/83
4,415,608	06/339,812	11/15/83
4,415,618	06/456,301	11/15/83
4,415,621	06/347,761	11/15/83
4,415,628	06/314,536	11/15/83
4,415,630	06/470,180	11/15/83
4,415,632	06/472,660	11/15/83
4,415,637	06/358,417	11/15/83
4,415,640	06/350,039	11/15/83
4,415,647	06/427,067	11/15/83
4,415,648	06/234,687	11/15/83
4,415,653	06/447,579	11/15/83
4,415,654	06/409,699	11/15/83
4,415,656	06/380,797	11/15/83
4,415,660	06/357,414	11/15/83
4,415,663	06/411,157	11/15/83
4,415,664	06/411,158	11/15/83
4,415,668	06/255,480	11/15/83

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4,415,669	06/327,837	11/15/83
4,415,672	06/380,464	11/15/83
4,415,674	06/367,198	11/15/83
4,415,675	06/410,232	11/15/83
4,415,676	06/410,297	11/15/83
4,415,680	06/427,142	11/15/83
4,415,683	06/362,228	11/15/83
4,415,688	06/443,274	11/15/83
4,415,689	06/415,204	11/15/83
4,415,697	06/292,858	11/15/83
4,415,702	06/347,259	11/15/83
4,415,707	06/401,052	11/15/83
4,415,709	06/308,583	11/15/83
4,415,711	06/394,672	11/15/83
4,415,716	06/228,951	11/15/83
4,415,717	06/439,093	11/15/83
4,415,719	06/328,383	11/15/83
4,415,721	06/232,929	11/15/83
4,415,722	06/360,045	11/15/83
4,415,730	06/391,284	11/15/83
4,415,733	06/244,312	11/15/83
4,415,736	06/334,838	11/15/83
4,415,737	06/451,349	11/15/83
4,415,738	06/281,858	11/15/83
4,415,750	06/358,314	11/15/83
4,415,751	06/319,846	11/15/83
4,415,756	06/326,644	11/15/83
4,415,757	06/358,103	11/15/83
4,415,759	06/310,012	11/15/83
4,415,760	06/367,815	11/15/83
4,415,761	06/283,556	11/15/83
4,415,763	06/349,562	11/15/83
4,415,765	06/261,161	11/15/83
4,415,771	06/250,779	11/15/83
4,415,775	06/295,945	11/15/83
4,415,776	06/255,272	11/15/83
4,415,783	06/420,322	11/15/83
4,415,786	06/361,261	11/15/83
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5,065,004	07/392,946	11/12/91
5,065,016	07/535,700	11/12/91
5,065,018	07/450,324	11/12/91
5,065,019	07/520,087	11/12/91
5,065,028	07/543,124	11/12/91
5,065,032	07/579,619	11/12/91
5,065,035	07/619,882	11/12/91
5,065,037	07/487,953	11/12/91
5,065,050	07/625,515	11/12/91
5,065,061	07/481,046	11/12/91
5,065,063	07/598,789	11/12/91
5,065,067	07/350,766	11/12/91
5,065,077	07/555,876	11/12/91
5,065,079	07/601,464	11/12/91
5,065,081	07/435,043	11/12/91
5,065,089	07/532,253	11/12/91
5,065,092	07/524,139	11/12/91
5,065,093	07/235,103	11/12/91
5,065,101	07/490,123	11/12/91
5,065,104	07/587,559	11/12/91
5,065,107	07/511,069	11/12/91
5,065,108	07/367,310	11/12/91
5,065,114	07/482,537	11/12/91
5,065,121	07/174,721	11/12/91
5,065,145	07/418,167	11/12/91
5,065,148	07/387,561	11/12/91
5,065,151	07/264,451	11/12/91
5,065,156	07/557,762	11/12/91
5,065,162	07/533,837	11/12/91
5,065,167	07/526,210	11/12/91
5,065,180	07/611,072	11/12/91
5,065,186	07/518,371	11/12/91
5,065,211	07/630,033	11/12/91
5,065,233	07/398,075	11/12/91
5,065,237	07/561,405	11/12/91
5,065,241	07/552,557	11/12/91
5,065,242	07/546,195	11/12/91
5,065,249	07/249,609	11/12/91
5,065,251	07/387,089	11/12/91
5,065,287	07/415,228	11/12/91
5,065,288	07/627,215	11/12/91
5,065,290	07/310,342	11/12/91
5,065,292	07/521,848	11/12/91
5,065,294	07/296,793	11/12/91
5,065,295	07/461,205	11/12/91
5,065,296	07/672,379	11/12/91
5,065,297	07/464,887	11/12/91
5,065,298	07/618,718	11/12/91
5,065,319	07/622,795	11/12/91
5,065,331	06/866,747	11/12/91
5,065,335	07/323,968	11/12/91
5,065,337	07/474,032	11/12/91
5,065,340	07/354,212	11/12/91
5,065,341	07/385,857	11/12/91
5,065,349	07/463,230	11/12/91
5,065,358	07/218,141	11/12/91
5,065,370	07/619,781	11/12/91
5,065,371	07/556,830	11/12/91
5,065,377	07/453,639	11/12/91
5,065,386	07/452,703	11/12/91
5,065,412	07/400,192	11/12/91
5,065,416	07/407,201	11/12/91
5,065,424	07/326,736	11/12/91
5,065,426	07/382,110	11/12/91
5,065,427	07/429,801	11/12/91

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,797,442, Re. S.N. 08/559,735, Nov. 15, 1995, Cl. 524, MELT PROCESSABLE CPVC BLENDS AND ALLOYS THEREOF, Richard C. Neuman, Owner of Record: *Inventor,* Attorney or Agent: Helen A. Odar, Ex. Gp.: 1511

4,826,831, Re. S.N. 08/542,941, Oct. 13, 1995, Cl. 514/170, METHOD OF HORMONAL TREATMENT FOR MENOPAUSAL OR POST MENOPAUSAL DISORDERS INVOLVING CONTINUOUS ADMINISTRATION OF PROGESTOGENS AND ESTROGENS, Earl R. Plunkett, et. al., Owner of Record: *Pre Jay Holdings Limited, Ontario, Canada, WOCO Investments Ltd., Ontario, Canada,* Attorney or Agent: Paul N. Kokulis, Ex. Gp.: 1205

5,014,362, Re. S.N. 08/556,080, Nov. 13, 1995, Cl. 002/168, ELASTOMERIC COVERING MATERIAL AND HAND GLOVE MADE THEREWITH, Neil E. Tillotson, et. al., Owner of Record: *First National Bank of Boston, Boston, Mass.,* Attorney or Agent: Peter G. Pappas, Ex. Gp.: 2407

5,204,555, Re. S.N. 08/425,753, Apr. 19, 1995, Cl. 307, LOGIC ARRAY HAVING HIGH FREQUENCY INTERNAL CLOCKING, Andrew C. Graham, Owner of Record: *Gazelle Microcircuits, Inc., Santa Clara, Calif.,* Attorney or Agent: Brian D. Ogonowsky, Ex. Gp.: 2500

5,241,669, Re. S.N. 08/521,712, Dec. 1, 1995, Cl. 395, METHOD AND SYSTEM FOR SIDEFILE STATUS POLLING IN A TIME ZERO BACKUP COPY PROCESS, Oded Cohn, et. al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.,* Attorney or Agent: Keith L. Hargrove, Ex. Gp.: 2313

5,250,237, Re. S.N. 08/541,348, Oct. 10, 1995, Cl. 264/13, ALCOHOL-BASED SPIN LIQUIDS FOR FLASH-SPINNING POLYMERIC PLEXIFILAMENTS, Hyunkook Shin, Owner of Record: *E.I. Du Pont De Nemous and Co., Wilmington, Del.,* Attorney or Agent: David W. Westphal, Ex. Gp.: 1306

5,260,551, Re. S.N. 08/555,500, Nov. 8, 1995, Cl. 235/382, TIME CONTROLLED LOCK SYSTEM, Tore Wiik, et. al., Owner of Record: *Trioving A.S., Moss, Norway,* Attorney or Agent: Donald C. Lucas, Ex. Gp.: 2514

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 33,939, Reexam. No. 90/004,053, Nov. 28, 1995, Cl. 280/646, TELESCOPIC AND COLLAPSIBLE GOLF CART, Alex Cheng, Owner of Record: *Unique Product & Design Co., Ltd., Yung Kang City, Taiwan,* Attorney or Agent: Philip Furgang, II, New York, N.Y., Ex. Gp.: 3106, Requester: Thomas M. Galgano, Galgano & Burke, Hauppauge, N.Y.

4,641,953, Reexam. No. 90/004,065, Dec. 8, 1995, Cl. 355/014.00R, IMAGE FORMING APPARATUS, Hideshi Oushiden, et. al., Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan,* Attorney or Agent: Richard L. Schwaab, Foley & Lardner, Washington, D.C., Ex. Gp.: 2105, Requester: Owner

4,710,016, Reexam. No. 90/004,066, Dec. 8, 1995, Cl. 355/004, DEVELOPING APPARATUS, Junji Waatanabe, Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan,* Attorney or Agent: Richard L. Schwaab, Foley & Lardner, Washington, D.C., Ex. Gp.: 2105, Requester: Owner

4,712,127, Reexam. No. 90/004,067, Dec. 27, 1995, Cl. 257/296, HIGH RELIABILITY METAL & RESIN CONTAINER FOR A SEMICONDUCTOR DEVICE, Piero Colombo, et. al., Owner of Record: *SGS-Thompson Microelectronics, Inc., Carrolton, Tex.,* Attorney or Agent: Kenneth L. Cage, Willian Brinks Hofer Gilson & Lione, Washington, D.C., Ex. Gp.: 2503, Requester: International Rectifier Corp., El Segundo, Calif., c/o Samuel H. Weiner, Ostrolenk Faber Gerb & Soffen, New York, N.Y.

4,729,915, Reexam. No. 90/004,056, Dec. 12, 1995, Cl. 358/527, METHOD AND APPARATUS FOR MAKING POSITIVE COPIES FROM DIAPOSITIVES, Eduard Wagensonner, Owner of Record: *AFGA-Gevaert Aktiengesellscaft, Leverkusen, Germany,* Attorney or Agent: Darby & Darby, New York, N.Y., Ex. Gp.: 2612, Requester: Owner

4,754,840, Reexam. No. 90/004,062, Dec. 22, 1995, Cl. 182/002, LEVELLING ASSEMBLY FOR WORK PLATFORMS ON ARTICULATING BOOMS, Wayne P. MacDonald, et. al., Owner of Record: *JLG Industries, Inc., McConnellsburg, Pa.,* Attorney or Agent: Foley & Lardner, Washington, D.C., Ex. Gp.: 3505, Requester: Owner

4,985,106, Reexam. No. 90/004,068, Dec. 27, 1995, Cl. 156/276, INSULATION STRUCTURE FOR APPLIANCES, Thomas E. Nelson, Owner of Record: *Soltech, Inc., Shelbyville, Ky.,* Attorney or Agent: James M. Durlacher, Woodland Emhardt Naughton Moriarty & McNett, Indianapolis, Ind., Ex. Gp.: 1304, Requester: James M. Durlacher, Woodland Emhardt Naughton Moriarty & McNett, Indianapolis, Ind.

5,001,386, Reexam. No. 90/004,060, Dec. 21, 1995, Cl. 315/219, CIRCUIT FOR DIMMING GAS DISCHARGE LAMPS WITHOUT INTRODUCING STRIATIONS, Charles R. Sullivan, et. al., Owner of Record: *Lutron Electronics Co., Inc., Coopersburg, Pa.,* Attorney or Agent: Gregory J. Lavorgna, Seidel, Gonda, Lavorgna & Monaco, Philadelphia, Pa., Ex. Gp.: 2502, Requester: Owner

5,041,763, Reexam. No. 90/004,061, Dec. 21, 1995, Cl. 315/176, CIRCUIT AND METHOD FOR IMPROVED DIMMING OF GAS DISCHARGE LAMPS, Charles R. Sullivan, et. al., Owner of Record: *Lutron Electronics Co., Inc., Coopersburg, Pa.,* Attorney or Agent: Gregory J. Lavorgna, Seidel, Gonda, Lavorgna & Monaco, Philadelphia, Pa., Ex. Gp.: 2502, Requester: Owner

5,114,777, Reexam. No. 90/004,054, Dec. 11, 1995, Cl. 428/137, WOVEN MULTILAYER PAPERMAKING FABRIC HAVING INCREASED STABILITY AND PERMEABILITY AND METHOD, Hermann Gaisser, Owner of Record: *Wangner Systems, Greenville, S.C.,* Attorney or Agent: Cort Flint, Greenville, S.C., Ex. Gp.: 1508, Requester: Asten, Inc., Charleston, S.C., c/o Volpe & Koenig, Philadelphia, Pa.

5,116,003, Reexam. No. 90/004,064, Dec. 7, 1995, Cl. 248/312, HANGER FOR ARTICLES OF DIFFERENT SIZES AND SHAPES, Karsten H. Gerhardt, Owner of Record: *Ultra Hold Corporation, Quebec, Canada,* Attorney or Agent: Marks & Murase, Washington, D.C., Ex. Gp.: 3505, Requester: Owner

5,207,812, Reexam. No. 90/004,052, Nov. 15, 1995, Cl. 55/498, FILTER CARTRIDGE, Gregory S. Tronto, et. al., Owner of Record: *W. L. Gore & Associates, Inc., aka Gore Holdings, Newark, Del.,* Attorney or Agent: Victor M. Genco, Jr., Gore Holdings, Inc., Newark, Del., Ex. Gp.: 1305, Requester: Owner

5,249,950, Reexam. No. 90/004,058, Dec. 15, 1995, Cl. 425/412, HEATED STRIPPER SHOE ASSEMBLY, Michael E. Woolford, Owner of Record: *Anchor Wall Systems, Inc., Minneapolis, Minn.,* Attorney or Agent: Merchant Gould Smith Edell

Welter & Schmidt, Minneapolis, Minn., Ex. Gp.: 1305, Requester: Owner

5,254,398, Reexam. No. 90/004,055, Dec. 11, 1995, Cl. 428/255, WOVEN MULTILAYER PAPERMAKING FABRIC HAVING INCREASED STABILITY AND PERMEABILITY AND METHOD, Hermann Gaisser, Owner of Record: *Wangner Systems, Greenville, S.C.,* Attorney or Agent: Cort Flint, Greenville, S.C., Ex. Gp.: 1504, Requester: Asten, Inc., Charleston, S.C., c/o Volpe & Koenig, Philadelphia, Pa.

5,295,297, Reexam. No. 90/004,063, Dec. 22, 1995, Cl. 029/827, METHOD OF PRODUCING SEMICONDUCTOR MEMORY, Wabei Kitamura, et. al., Owner of Record: *Hitachi Ltd., Tokyo, Japan,* Attorney or Agent: Antonelli Terry Stout & Kraus, Arlington, Va., Ex. Gp.: 3206, Requester: Owner

5,314,465, Reexam. No. 90/004,059, Dec. 18, 1995, Cl. 607/138, INCONTINENCE ELECTRODE APPARATUS AND METHOD, Donald D. Maurer, et. al., Owner of Record: *Empi Inc., St. Paul, Minn.,* Attorney or Agent: David R. Fairbairn, Kinney & Lange, Minneapolis, Minn., Ex. Gp.: 3311, Requester: Owner

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Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED OCTOBER 23, 1995 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
11,863	70/011,863	01/20/1885
101,895	71/073,436	01/19/1915
101,956	71/081,425	01/19/1915
102,002	71/080,596	01/19/1915
320,869	71/355,529	01/15/1935
320,877	71/355,964	01/15/1935
320,878	71/319,115	01/15/1935
320,890	71/356,582	01/15/1935
320,931	71/355,242	01/15/1935
320,933	71/356,666	01/15/1935
320,934	71/356,653	01/15/1935
320,955	71/356,550	01/15/1935
320,957	71/356,548	01/15/1935
320,970	71/356,903	01/15/1935
320,978	71/356,786	01/15/1935
320,992	71/356,444	01/15/1935
320,994	71/356,440	01/15/1935
320,999	71/356,424	01/15/1935
321,009	71/354,148	01/15/1935
321,012	71/354,391	01/15/1935
321,026	71/349,756	01/15/1935
321,031	71/355,823	01/15/1935
321,038	71/355,882	01/15/1935
321,042	71/354,751	01/15/1935
321,051	71/340,603	01/15/1935
321,059	71/344,137	01/15/1935
321,082	71/353,337	01/15/1935
597,971	71/649,372	11/09/1954
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600,886	71/656,291	01/18/1955
600,901	71/655,413	01/18/1955
600,907	71/666,140	01/18/1955
600,908	71/638,470	01/18/1955
600,914	71/664,254	01/18/1955
600,919	71/632,607	01/18/1955
600,921	71/650,943	01/18/1955
600,925	71/658,348	01/18/1955
600,944	71/588,520	01/18/1955
600,947	71/653,367	01/18/1955
600,950	71/660,096	01/18/1955
600,956	71/663,151	01/18/1955
600,957	71/663,198	01/18/1955
600,979	71/652,022	01/18/1955
600,988	71/655,014	01/18/1955
600,991	71/655,492	01/18/1955
600,993	71/656,241	01/18/1955
600,997	71/657,581	01/18/1955
601,002	71/659,867	01/18/1955
601,007	71/662,250	01/18/1955
601,011	71/662,822	01/18/1955
601,013	71/663,049	01/18/1955
601,022	71/625,071	01/18/1955
601,030	71/636,309	01/18/1955
601,031	71/636,360	01/18/1955
601,042	71/630,407	01/18/1955
601,043	71/643,046	01/18/1955
601,049	71/635,269	01/18/1955
601,051	71/651,356	01/18/1955
601,064	71/659,822	01/18/1955
601,072	71/664,983	01/18/1955
601,076	71/665,417	01/18/1955
601,077	71/665,452	01/18/1955
601,090	71/666,614	01/18/1955
601,093	71/636,589	01/18/1955
601,096	71/645,986	01/18/1955
601,103	71/657,393	01/18/1955
601,111	71/662,243	01/18/1955
601,114	71/664,294	01/18/1955
601,115	71/664,451	01/18/1955
601,116	71/643,881	01/18/1955
601,121	71/639,190	01/18/1955
601,128	71/656,384	01/18/1955
601,129	71/657,633	01/18/1955
601,131	71/659,457	01/18/1955
601,132	71/660,082	01/18/1955
601,134	71/664,508	01/18/1955
601,141	71/663,047	01/18/1955
601,149	71/646,195	01/18/1955
601,159	71/604,995	01/18/1955
967,991	72/436,603	09/11/1973
992,367	72/462,457	09/03/1974
1,000,259	72/443,594	12/24/1974
1,001,373	73/000,274	01/14/1975
1,001,375	73/003,340	01/14/1975
1,001,377	73/005,188	01/14/1975
1,001,379	73/007,509	01/14/1975
1,001,383	73/009,439	01/14/1975
1,001,389	73/010,353	01/14/1975
1,001,391	73/016,409	01/14/1975
1,001,394	73/010,324	01/14/1975
1,001,398	73/016,266	01/14/1975
1,001,399	73/016,910	01/14/1975
1,001,404	73/026,035	01/14/1975
1,001,405	73/026,037	01/14/1975
1,001,406	73/026,765	01/14/1975
1,001,408	73/028,239	01/14/1975
1,001,409	73/003,686	01/14/1975
1,001,411	73/005,021	01/14/1975
1,001,414	73/008,147	01/14/1975
1,001,415	73/012,185	01/14/1975
1,001,417	73/016,024	01/14/1975
1,001,420	73/028,491	01/14/1975
1,001,423	73/008,356	01/14/1975
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1,001,430	73/016,682	01/14/1975
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1,001,438	73/001,668	01/14/1975
1,001,440	73/006,865	01/14/1975
1,001,442	73/015,854	01/14/1975
1,001,446	73/003,016	01/14/1975
1,001,450	73/007,385	01/14/1975
1,001,451	73/007,971	01/14/1975
1,001,452	73/008,038	01/14/1975
1,001,456	73/014,709	01/14/1975
1,001,457	73/016,731	01/14/1975
1,001,458	73/016,973	01/14/1975
1,001,459	73/017,501	01/14/1975
1,001,464	73/016,791	01/14/1975
1,001,465	73/016,949	01/14/1975
1,001,467	73/002,260	01/14/1975
1,001,468	73/003,004	01/14/1975
1,001,469	73/003,039	01/14/1975
1,001,473	73/004,468	01/14/1975
1,001,474	73/004,802	01/14/1975
1,001,475	73/004,803	01/14/1975
1,001,476	73/004,804	01/14/1975
1,001,487	73/012,779	01/14/1975
1,001,497	73/003,957	01/14/1975
1,001,500	73/006,311	01/14/1975
1,001,503	73/008,735	01/14/1975
1,001,511	73/010,171	01/14/1975
1,001,515	73/015,124	01/14/1975
1,001,516	73/019,793	01/14/1975
1,001,524	73/015,704	01/14/1975
1,001,528	73/000,708	01/14/1975
1,001,529	73/001,176	01/14/1975
1,001,532	73/007,163	01/14/1975
1,001,534	73/008,522	01/14/1975
1,001,538	73/013,815	01/14/1975
1,001,539	73/014,167	01/14/1975
1,001,546	73/006,456	01/14/1975
1,001,547	73/013,725	01/14/1975
1,001,548	73/004,815	01/14/1975
1,001,549	73/014,119	01/14/1975
1,001,550	73/014,120	01/14/1975
1,001,551	73/014,157	01/14/1975
1,001,553	73/016,166	01/14/1975
1,001,554	73/004,854	01/14/1975
1,001,556	73/001,763	01/14/1975
1,001,558	73/005,826	01/14/1975
1,001,561	73/000,108	01/14/1975
1,001,563	73/002,844	01/14/1975
1,001,564	73/007,338	01/14/1975
1,001,574	73/021,857	01/14/1975
1,001,575	73/022,340	01/14/1975
1,001,576	73/024,870	01/14/1975
1,001,581	73/000,944	01/14/1975
1,001,587	73/007,506	01/14/1975
1,001,597	73/000,039	01/14/1975
1,001,598	73/002,416	01/14/1975
1,001,601	73/003,140	01/14/1975
1,001,606	73/012,545	01/14/1975
1,001,613	73/004,050	01/14/1975
1,001,616	73/007,286	01/14/1975
1,001,619	73/012,001	01/14/1975
1,001,620	73/012,589	01/14/1975
1,001,622	73/008,634	01/14/1975
1,001,623	73/008,934	01/14/1975
1,001,626	73/014,378	01/14/1975
1,001,627	73/015,525	01/14/1975
1,001,628	73/014,415	01/14/1975
1,001,629	73/015,890	01/14/1975
1,001,630	73/000,337	01/14/1975
1,001,638	73/021,399	01/14/1975
1,001,639	73/022,711	01/14/1975
1,001,641	73/007,147	01/14/1975
1,001,642	73/008,122	01/14/1975
1,001,649	73/018,831	01/14/1975
1,001,650	73/018,832	01/14/1975
1,001,651	73/024,220	01/14/1975
1,001,657	73/000,469	01/14/1975
1,001,664	73/013,402	01/14/1975
1,001,675	73/010,670	01/14/1975
1,001,677	73/012,991	01/14/1975
1,001,678	73/013,106	01/14/1975
1,001,680	73/014,878	01/14/1975
1,001,683	73/016,186	01/14/1975
1,001,693	73/018,746	01/14/1975
1,001,705	72/454,794	01/14/1975
1,001,706	72/459,548	01/14/1975
1,001,707	72/460,862	01/14/1975
1,001,716	72/457,973	01/14/1975
1,001,718	72/464,706	01/14/1975
1,001,719	72/425,381	01/14/1975
1,001,720	72/438,938	01/14/1975
1,001,723	72/464,073	01/14/1975
1,001,725	72/465,332	01/14/1975
1,001,726	72/465,926	01/14/1975
1,001,731	72/412,063	01/14/1975
1,001,734	72/424,374	01/14/1975
1,001,736	72/445,818	01/14/1975
1,001,738	72/446,924	01/14/1975
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1,001,743	72/459,658	01/14/1975
1,001,744	72/466,186	01/14/1975
1,001,745	72/460,035	01/14/1975
1,001,747	72/439,036	01/14/1975
1,001,748	72/447,016	01/14/1975
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Disclaimer

D. 359,707—Seymour Cohen, Jericho, N.Y. SLEEPING MRS. SANTA CLAUS FIGURE. Patent dated June 27, 1995. Disclaimer filed September 15, 1995, by the assignee, Telco Creations, Inc.

Hereby enters this disclaimer to all claims of said patent.

D. 360,165—Seymour Cohen, Jericho, N.Y. SLEEPING SANTA CLAUS FIGURE. Patent dated July 11, 1995. Disclaimer filed September 15, 1995, by the assignee, Telco Creations, Inc.

Hereby enters this disclaimer to all claims of said patent.

4,793,355—Duane B. Crum, San Diego; Ronald C. Welsey, Cardiff; Richard E. Greenblatt, San Diego; Roberta M. Toussaint, Olivenhain; Eugene C. Hirschkoff, Leucadia, all of Calif. APPARATUS FOR PROCESS FOR MAKING BIOMAGNETIC MEASUREMENTS. Patent dated December 27, 1988. Disclaimer filed October 16, 1995, by the assignee, Biomagnetic Technologies, Inc.

Hereby enters this disclaimer to claims 1-24 of said patent.

5,398,613—Bernard Amiot, Cedex; Gilles Doisneau, Meug Sur Loire; Jean-Pierre Frehaut, Versailles; Serge Morin, Paris, all of France. SYSTEM FOR THE TILTING OF A SUSPENDED OBJECT WITH TENSIONING ROLLER FOR SUSPENSION LINE. Patent dated March 21, 1995. Disclaimer filed August 17, 1995, by the assignee, Thomson-Brandt Armements.

Hereby enters this disclaimer to claim 8 of said patent.

Disclaimer and Dedication

4,581,429—David H. Solomon, Glen Waverley; Ezio Rizzardo, Wheelers Hill; Paul Cacioli, Reservoir, all of Australia. POLYMERIZATION PROCESS AND POLYMERS PRODUCED THEREBY. Patent dated April 8, 1986. Disclaimer and dedication filed October 24, 1995, by the assignee, Commonwealth Scientific and Industrial Research Organization.

Hereby disclaims and dedicates to the public claims 16-19 of said patent.

Certificate of Correction For Week of January 23, 1996

Re. 34,735	5,234,925	5,355,216	5,403,724
D. 359,030	5,234,935	5,357,807	5,404,171
D. 360,341	5,238,382	5,362,306	5,404,308
D. 360,867	5,250,469	5,364,912	5,405,494
D. 363,236	5,263,723	5,367,607	5,406,010
D. 363,278	5,265,272	5,368,712	5,406,287
D. 363,630	5,281,501	5,369,008	5,406,548
4,948,882	5,290,636	5,370,713	5,409,481
4,949,543	5,299,267	5,371,193	5,411,918
4,980,279	5,310,662	5,379,828	5,412,176
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5,018,140	5,326,693	5,381,468	5,415,603
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5,089,480	5,335,267	5,391,531	5,416,889
5,102,032	5,335,665	5,393,760	5,417,558
5,132,126	5,335,802	5,394,649	5,419,321
5,134,609	5,340,065	5,396,369	5,419,461
5,141,014	5,342,783	5,397,776	5,419,688
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5,219,974	5,346,939	5,401,190	5,420,438
5,220,433	5,347,333	5,401,509	5,422,738
5,221,139	5,352,687	5,401,766	5,422,970
5,227,570	5,354,259	5,403,648	5,423,378
5,234,598	5,354,743	5,403,711	5,424,277
5,425,913	5,439,046	5,450,170	5,456,504
5,426,934	5,439,143	5,450,181	5,456,591
5,426,984	5,439,180	5,450,583	5,456,651
5,427,173	5,439,951	5,450,892	5,456,840
5,427,370	5,440,432	5,451,690	5,457,108
5,427,713	5,440,595	5,451,714	5,457,308
5,429,022	5,442,314	5,451,914	5,457,544
5,430,551	5,442,975	5,452,027	5,457,987
5,431,855	5,443,248	5,452,163	5,458,728
5,431,954	5,443,332	5,452,382	5,459,224
5,432,288	5,443,899	5,452,501	5,459,387
5,432,529	5,443,980	5,452,555	5,459,404
5,432,715	5,444,829	5,452,814	5,459,468
5,432,869	5,444,975	5,453,118	5,459,915
5,433,091	5,446,037	5,453,315	5,460,024
5,433,787	5,446,071	5,453,434	5,460,163
5,434,411	5,446,875	5,453,501	5,460,505
5,434,824	5,447,562	5,453,601	5,460,507
5,435,564	5,447,635	5,453,831	5,460,816
5,435,787	5,447,858	5,454,190	5,460,829
5,435,835	5,448,267	5,454,381	5,461,034
5,436,352	5,448,339	5,454,925	5,461,077
5,436,736	5,448,483	5,455,217	5,461,373
5,436,778	5,448,661	5,455,284	5,461,574
5,437,008	5,449,117	5,455,362	5,461,831
5,437,462	5,449,540	5,455,407	5,461,889
5,437,624	5,449,717	5,455,657	5,463,456
5,438,190	5,449,886	5,455,774	5,463,930
5,438,202	5,450,005	5,455,925	5,464,466
5,438,648	5,450,129	5,455,978	5,466,272
			5,468,967

Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

October 16-20, 1995

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
10-17	EX	74/071,233	Clarkson Controls & Equipment Co.	whether the two-dimensional representation of the three-dimensional configuration of applicant's goods, which representation applicant claims is its trademark, is de jure functional	Refusal Reversed		two-dimensional representation of the configuration of applicant's goods, namely, plastic tower packings for gas-liquid contact systems such as chemical recovery systems, water degasifiers, fume scrubbers for atmospheric pollution control, fruit storage controlled atmosphere systems, solution tanks for dissolved air flotation systems, and the like		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

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Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
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Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
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Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
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Box PATENT APPLICATION	New patent application and associated papers and fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filings of all provisional patent applications and any communications relating thereto.
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Box Reexam	Requests for Reexamination for *original* request papers *only*.
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Box TTAB FEE	Oppositions, Cancellation petitions, and ex parte appeals.
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Box 6	Mail for the Office of Procurement.
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Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
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All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

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	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Patent Clearinghouse	(408) 730-7290
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	St. Louis Public Library	(314) 241-2288 Ext. 390
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	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
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PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	06/16/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	06/28/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	08/26/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	09/15/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	03/22/94
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INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	01/17/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	05/31/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	06/23/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/30/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	05/24/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	04/19/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	05/30/94
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HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	05/12/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	07/12/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	09/26/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	08/25/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	06/20/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of October 1, 1995

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/23/95	05/25/95
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	07/03/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/26/95	08/21/95
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/06/95	08/14/95
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	05/01/95
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/14/95	07/03/95
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/02/95	07/24/95
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions– Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/95	06/17/95
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/30/95	05/30/95
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	02/14/95	—0—
Renewals (All Classes)	07/25/95	—0—
Section 12(c) Publications (All Classes)	04/11/95	—0—

1. ** Assigned to all Law Office

2. Applicants with inquires concerning the status of their applications and a touch tone phone should call (703) 305–8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquires concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

JANUARY 23, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 34,069 (2776th)

PROCESS FOR THE PREPARATION OF OLIGONUCLEOTIDES

Hubert Köster, Concord, Mass., and Nanda D. Sinha, San Rafael, Calif., assignors to Millipore Corporation, Bedford, Mass.

Reexamination Request No. 90/003,459, Jun. 10, 1994.

Reexamination Certificate for Reissue Patent Re. 34,069, issued Sep. 15, 1992, Ser. No. 481,572, Feb. 16, 1990.

Original No. 4,725,677, dated Feb. 16, 1988, Ser. No. 752,178, Aug. 10, 1984.

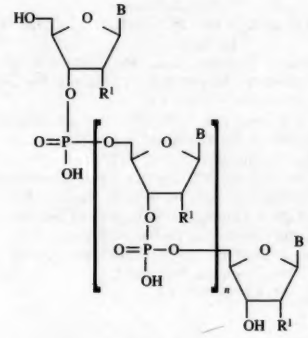
Int. Cl.[6] **C07H** *15/12;17/00*

U.S. Cl. 536—25.34

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

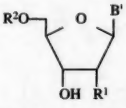
The patentability of claims **1–19** is confirmed.

1. A process for the preparation of oligonucleotides of the formula **1**



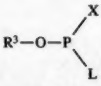
in which B denotes a nucleoside base, R^1 denotes hydrogen, hydroxyl or hydroxyl which is protected by, where appropriate, a removable protective group and n denotes an integer from 1 to 200, comprising the steps of

(a) reacting a nucleoside of the formula II



(II)

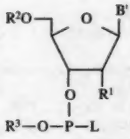
in which R^1 as defined as above, and R^2 denotes a removable protective group and B' denotes the nucleotide base B protected by the protective groups which can be eliminated, with a phosphine derivative of the formula III



(III)

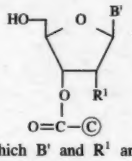
in which R^3 is a protective group which can be eliminated, and X and L are groups which react with hydroxyl groups in the sugar nioieties of the nucleotides or nucleosides, in the presence of a base to thereby form a nucleotide phosphite

(b) reacting the nucleotide phosphite obtained in step (a) and represented by the formula IV



(IV)

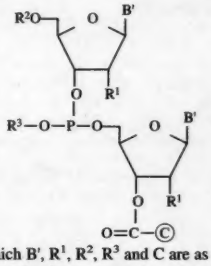
in which B', R^1, R^2, R^3 and L are as defined above, with a nucleoside, of the formula V, bound to a polymeric carrier



(V)

in which B' and R^1 are as defined above and C denotes the polymeric carrier;

(c) oxidizing the carrier-bound nucleoside-nucleotides obtained in step (b) and represented by the formula:



(VI)

in which B', R^1, R^2, R^3 and C are as defined above, with formation of phosphotriester groups,

(d) blocking free primary 5—OH groups, which have not been reacted in the reaction according to step (b), with permanent protective groups;

(e) eliminating the protective group R^2;

(f) optionally repeating steps (a) to (e) to introduce further nucleoside phosphate or oligonucleoside phosphate units; and

(g) cleaving the nucleoside carrier bond and optionally eliminating the protective groups present in the oligonucleoside phosphates, which process comprises using in step (a) as the phosphine derivative of the formula III a compound in which R^3 denotes a group of the formula VI

(VII)

in which the groups Y, which can be identical or different, represent hydrogen, methyl, and/or ethyl and Z represents an electron-attracting group, where, in the phosphine derivative of the formula III, X is chlorine, bromine, CN or SCN and L is CN or CNS, a secondary amino radical of the formula (VIII)

(VIII)

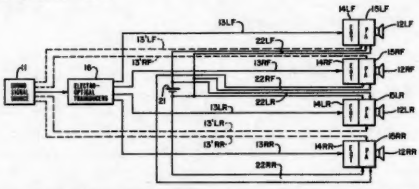
where the groups R^4 are primary, secondary, or tertiary alkyl radicals having 1–10 carbon atoms, or together form a cycloalky radical having 5–7 carbon atoms, which can contain one or two nitrogen, oxygen, or sulfur atoms as hereoatoms, or are imidazole, triazole, tetrazole, 3-nitro-1,2,4-triazole, thiazole, pyrrole, benzotriazole, benzohydroxytriazole, imidazole substituted in the phenyl moiety, triazole substituted in the phenyl moiety, tetrazole substi-

tuted in the phenyl moiety, 3-nitro- 1,2,4-triazole substituted in the phenyl moiety, thiazole substituted in the phenyl moiety, pyrrole substituted in the phenyl moeity, or benzohydroxytriazole substituted in the phenyl moeity.

B1 4,282,605 (2777th)
SOUND REPRODUCING WITH REMOTE AMPLIFYING TRANSDUCER

Amar G. Bose, Wayland, Mass., assignor to Bose Corporation, Framingham, Mass.

Reexamination Request No. 90/002,546, Dec. 27, 1991.
Reexamination Certificate for Patent 4,282,605, issued Aug. 4, 1981, Ser. No. 82,300, Oct. 5, 1979.
Int. Cl.[6] H04B *10/00*
U.S. Cl. 359—157



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **7** is confirmed.

Claim **6** was previously disclaimed.

Claims **1–5** are cancelled.

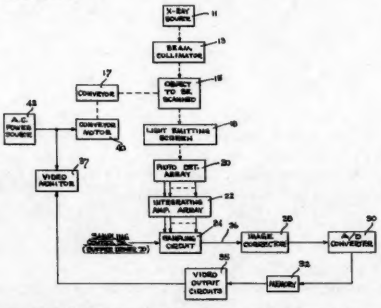
7. Vehicle sound reproducing apparatus in accordance with claim **6** wherein said means for coupling comprises source electro-optical transducing means at the location of said source and a corresponding plurality of receiving electro-optical transducing means each integrated with a respective one of said power amplifying means,

and a corresponding plurality of light pipe means for coupling said source electro-optical transducing means to a respective one of said receiving electro-optical transducing means.

B1 4,366,382 (2778th)
X-RAY LINE SCAN SYSTEM FOR USE IN BAGGAGE INSPECTION

Andreas F. Kotowski, Covina, Calif., assignor to Scanray Corporation, Calif.

Reexamination Request No. 90/003,947, Sep. 11, 1995.
Reexamination Certificate for Patent 4,366,382, issued Dec. 28, 1982, Ser. No. 185,561, Sep. 9, 1980.
Int. Cl.[6] G01N *23/00*
U.S. Cl. 378—57



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

1. A system for inspecting objects including

an x-ray source,

conveyor means for moving said objects through rays in the output of said source,

means for receiving said rays after they have passed through said objects,

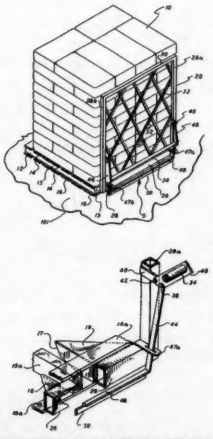
means responsive to the output of said receiving means for providing a video display in accordance with the receiving means output comprising a light-emitting screen in the form of a strip, an array of photo-detectors opposite said screen for generating electrical signals in accordance with the light emission of the portions of the screen thereopposite, separate means for individually integrating the output of each of said detectors, electronic sampling circuit means for time multiplexing the outputs of said integrating means to provide a series of sequential pulses representing the outputs of said integrating means, means responsive to said pulses for generating video output signals, and video monitor means responsive to said video output signals for displaying said video output signals, and

means for collimating the rays of said source into a narrow fan-shaped beam prior to their passage through the objects, said beam scanning said objects in successive slices as the conveyor means moves the objects therethrough.

B1 4,756,651 (2779th)
CARGO RESTRAINING DEVICE FOR PALLETIZED LOADS

James J. Van Gompel, Fremont, Ind., and Ronald R. Akey, Footville, Wis., assignors to Bruce P. Purdy, and Barabara G. Purdy, both of Incline Village, Nev.

Reexamination Request No. 90/003,742, Feb. 24, 1995.
Reexamination Certificate for Patent 4,756,651, issued Jul. 12, 1988, Ser. No. 13,197, Feb. 9, 1987.
Continuation of Ser. No. 898757, Aug. 13, 1986, abandoned, which is a continuation of Ser. No. 640338, Aug. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 370131, Apr. 20, 1982, Pat. No. 4,515,506.
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.[6] B60P *1/64;7/13*
U.S. Cl. 410—46



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–3** is confirmed.

2. A cargo restraining wheel-free device comprising:

(a) A bifurcated platform for interengagement with a pallet with a cargo load upon said pallet, said pallet being of the type including an upper surface, a lower surface, and intervening

cross-ties, said platform having two horizontal portions separated by a slot therebetween for receiving a cross-tie of the pallet upon insertion of said platform into the space between said upper and lower surfaces of said pallet with said portions adjacent the sides of said cross-tie;

(b) a vertical frame extending upwardly from one end of the platform; and

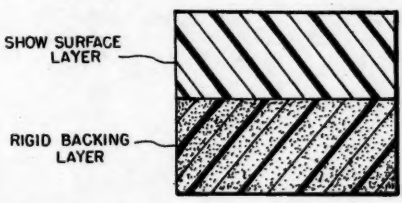
(c) a handle and hinge means at one side of the platform pivotally securing the handle to said frame at a pivot, said vertically-extending member being connected to a horizontal friction member adapted to extend downwardly beyond the bottom of said pallet when said handle is moved downwardly and; said second pivot being displaced past its vertically aligned lowermost point of rotation with respect to said first pivot and toward said vertical frame when said handle is moved downwardly, said vertically-extending members being thereby angled with their lower ends further away from said vertical frame and platform than their upper ends, thereby locking said handle in said downward position; said horizontal friction member in its said extended position acting by contacting an underlying supporting surface to tip said frame to effect frictional contact between said platform and upper support surface to prevent movement of said pallet with respect to said platform, and restrain movement of said device with respect to the underlying support by the resulting increase in frictional contact between said horizontal friction member and said support surface, at least the lower face of said horizontal member comprising a frictional material which is placed in contact with said underlying supporting surface.

B1 4,784,904 (2780th)

REINFORCED SHAPED ARTICLE

Richard Wood, Blackburn, and Gerald N. Nicholl, Bury, both of, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Reexamination Request No. 90/002,965, Feb. 1, 1993.
Reexamination Certificate for Patent 4,784,904, issued Nov. 15, 1988, Ser. No. 880,729, Jul. 1, 1986.
Claims priority, application United Kingdom, Jul. 1, 1985, 8516617
Int. Cl.[6] B32B *5/22;* **B29C** *67/00*
U.S. Cl. 428—317.9



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2**, **4**, **6** and **9** are cancelled.

Claims **1**, **3**, **5**, **7** and **8** are determined to be patentable as amended.

Claim **10**, dependent on an amended claim, is determined to be patentable.

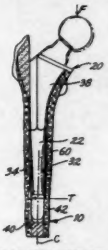
1. Shaped article *of sanitaryware* having a show surface of **[**thermoplastic material**]** *an acrylic polymer sheet* with a reinforcement of a rigid polyurethane or polyisocyanurate foam, characterized in that the foam **[**is substantially free from halocarbon**]** *contains water as the* blowing agent *in an amount ranging from 0.1 to 1% by weight based on weight of polyol present in the foam, said foam having a density of 300 –600 kg/m^3 and being characterized by its improved resistance to delamination or distortion when subject to elevated temperatures in comparison with a corresponding article when halocarbon blowing agent is used instead of water.*

B1 4,888,023 (2782th)

FEMORAL PROSTHESIS WITH UNCOUPLED DISTAL TIP

Robert G. Averill, Ringwood, and Robert C. Cohen, Denville, both of N.J., assignors to Osteonics Corp., Allendale, N.J.

Reexamination Request No. 90/003,379, Mar. 30, 1994.
Reexamination Certificate for Patent 4,888,023, issued Dec. 19, 1989, Ser. No. 145,794, Jan. 19, 1988.
Int. Cl.[6] A61F *2/32*
U.S. Cl. 623—22



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–14** is confirmed.

1. In a stem-type femoral prosthesis for implantation in a resected proximal end of a femur, the prosthesis including a stem to be received within the prepared femur, the stem having a proximal end, an affixation surface adjacent the proximal end for enabling the stem to be affixed in place when seated properly within the prepared femur, and a distal end spaced axially downwardly from the proximal end for reception within a passage created in the wall of the prepared femur, the improvement comprising: a distal tip integral with the distal end of the stem, the distal tip being spaced axially downwardly from the affixation surface a distance sufficient to enable seating of the distal tip within harder portions of the bone in the wall of the femur when the affixation surface is properly seated in the prepared femur, the stem including a shaft portion located between the affixation surface and the distal tip, the shaft portion having a diameter smaller than the corresponding diameter of the distal tip for enabling flexing in the shaft portion, and the distal tip having an external peripheral surface for engaging said harder portions of bone to confine the distal tip against transverse movements within the passage upon completion of the implantation, and a fixation-resistant surface finish on the external peripheral surface for maintaining the distal tip unaffixed to the femur and moveable axially relative to the wall of the femur to permit axial displacement of the distal tip and the distal end in response to forces applied to the prosthesis during use of the prosthesis.

B1 5,141,509 (2783th)

PENILE PROSTHESIS HAVING MEANS FOR PREVENTING SPONTANEOUS INFLATION

John H. Burton, Minnetonka, and Dezso K. Levius, Bloomington, both of Minn., assignors to American Medical Systems, Inc., Minnetonka, Minn.

Reexamination Request No. 90/003,438, May 17, 1994.
Reexamination Certificate for Patent 5,141,509, issued Aug. 25, 1992, Ser. No. 741,004, Aug. 6, 1991.
Int. Cl.[6] A61F *2/02*
U.S. Cl. 623—11

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

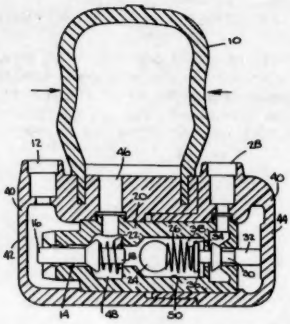
The patentability of claims **3**, **8** & **9** is confirmed.

Claim **6** is cancelled.

Claims **1** & **2** are determined to be patentable as amended.

Claims **4**, **5** & **7**, dependent on an amended claim, are determined to be patentable.

1. An inflatable penile prosthesis comprising means for causing or maintaining erection of a penis, said means having at least one



inflatable cylinder or pressurizable *chamber* for insertion into the penis, a fluid reservoir, pump means, and valves for permitting the flow of fluid between said reservoir and said cylinder or chamber as a consequence of predetermined pressure changes within the prosthesis, and an additional valve disposed at a predetermined designated point along the flow passage between the reservoir and the cylinder or chamber, *said additional valve being a bi-stable valve having an open mode in which fluid is permitted to flow through said additional valve and a closed mode in which fluid is unable to flow through said additional valve, said additional valve being designed to remain in the open mode or the closed mode unless directed to the other mode by a volitional force,* said additional valve acting to prevent the spontaneous inflation of the prosthesis occasioned by the unwanted transfer of fluid from the reservoir to the cylinder of chamber by remaining closed, as desired, until opened by the application of suitable predetermined pressure or force exerted volitionally from without the prosthesis.

B1 5,146,550 (2784th)

PROCESS FOR DISPLAYING MEASURING RESULTS IN GRAPHIC FORM IN TEST APPARATUS FOR TESTING TEXTILE GOODS AND APPARATUS FOR CARRYING OUT THE PROCESS

Richard Furter, Zug, and Benno Christen, Winterthur, both of, Switzerland, assignors to Zellweger Uster Ltd., Uster, Switzerland

Reexamination Request No. 90/003,507, Jul. 25, 1994.

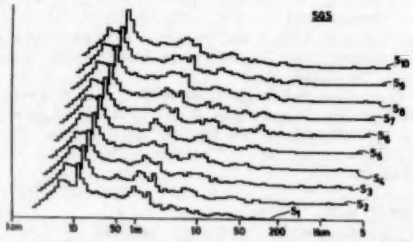
Reexamination Certificate for Patent 5,146,550, issued Sep. 8, 1992, Ser. No. 731,266, Jul. 17, 1991.

Continuation of Ser. No. 52,410, May 21, 1987, abandoned.

Claims priority, application Switzerland, May 21, 1986, 02043/86

Int. Cl.[6] **G06F** *17/60;19/00*

U.S. Cl. 395—140



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–24** is confirmed.

4. A method for testing rovings, yarns or slivers and providing a presentation of information indicating a quality of the tested material, comprising the steps of:

(a) running a sample roving, yarn or sliver lengthwise past a sensing head of a test apparatus, said sensing head being operative to produce signals indicating values along the length of said sample;

(b) analyzing variations caused in said sensing head signals when said sample roving, yarn or sliver moves lengthwise past said sensing head to produce a set of analytical quantities plottable as a graph;

(c) storing said set of analytical quantities in a memory;

(d) repeating steps (a)–(c) for a plurality of said samples; and

(e) presenting, in the form of a collective chart, a graph for each of said sets of analytical quantities, while providing a vertical and horizontal shift of said individual graphs relative to one another to produce a three-dimensional effect.

B1 5,263,794 (2785th)

ENVIRONMENTALLY SAFE UNDERGROUND PIPING SYSTEM

Michael C. Webb, Chester Springs, Pa., assignor to Environ Products, Inc., Lionville, Pa.

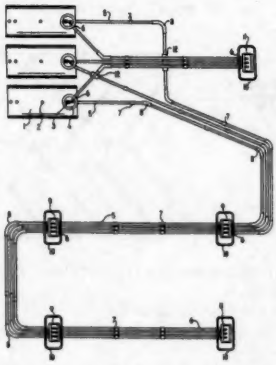
Reexamination Request No. 90/003,761, Mar. 22, 1995.

Reexamination Certificate for Patent 5,263,794, issued Nov. 23, 1993, Ser. No. 838,615, Feb. 19, 1992.

The portion of the term of this patent subsequent to Mar. 29, 2011, has been disclosed.

Int. Cl.[6] **F16L** *1/00*

U.S. Cl. 405—52



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2–5**, **10**, **14–17** and **22** is confirmed.

Claims **1**, **11–13** and **23** are cancelled.

Claims **6–9**, **18–21**, **24** and **25** are determined to be patentable as amended.

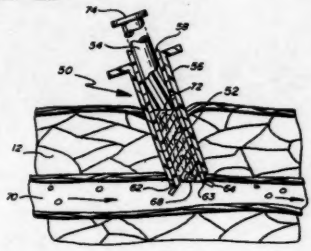
6. A secondarily contained underground piping system as claimed in claim **[1]** *3* wherein said flexible supply pipe has smooth inner and outer surfaces and is made of fiber reinforced thermal plastic composite material.

B1 5,275,616 (2786th)

INSERTION ASSEMBLY AND METHOD OF INSERTING A VESSEL PLUG INTO THE BODY OF A PATIENT

Bradford C. Fowler, Woodinville, Wash., assignor to Quinton Instruments Company, Seattle, Wash.

Reexamination Request No. 90/003,529, Aug. 12, 1994.
Reexamination Certificate for Patent 5,275,616, issued Jan. 4, 1994, Ser. No. 993,328, Dec. 18, 1992.
Continuation of Ser. No. 826,719, Jan. 28, 1992, Pat. No. 5,192,300, which is a continuation of Ser. No. 591,342, Jan. 1, 1990, Pat. No. 5,108,421.
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—213



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** and **16–20** is confirmed.

Claim **9** is determined to be patentable as amended.

Claims **10–15**, dependent on an amended claim, are determined to be patentable.

IG

1. A closure device for sealing an incision formed in the body of a patient wherein the incision extends from the skin of the patient through the lumen of a blood vessel and into a blood vessel of the patient, said closure device including a plug means comprising:

an elongate and generally cylindrical vessel plug having distal and proximal ends, and said vessel plug has a length sufficient to be received in the incision such that said distal end is positioned at a first predetermined position in the incision proximally of the lumen of the blood vessel of the patient, and said proximal end is positioned adjacent to the outer surface skin of the patient to obstruct the flow of blood from the blood vessel into the incision; and

wherein said distal end of said vessel plug is oriented at an angle of approximately 25 to 45 degrees with respect to the lenghtwise dimension of said vessel plug.

REISSUES

JANUARY 23, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,147

DENTAL TOOL HOLDER

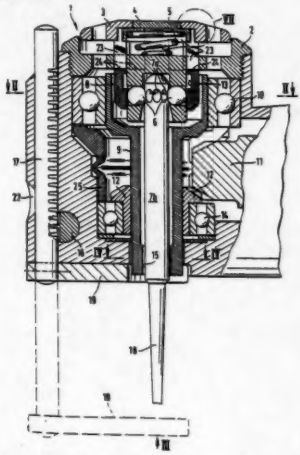
Marc F. C. Apap, Montrouge; Cedric L. M. C. Thorin, Paris, both of, France; Otto Rosenstatter, Seeham, and Peter Malata, Bürmoos, both of, Austria, assignors to Dentalwerk Bürmoos Gesellschaft m.b.H., Bürmoos, Austria

Original No. 4,940,410, dated Jul. 10, 1990, Ser. No. 235,649, Aug. 24, 1988. Application for reissue Jul. 8, 1992, Ser. No. 910,603

Claims priority, application Austria, Aug. 24, 1987, A 2108187

Int. Cl.[6] A61C *5/02*

U.S. Cl. 433—102 **9 Claims**



1. A dental toolholder apparatus in combination with and for holding an endodontic filing tool having a filing end for filing tooth material, and a shaft connected to the filing end, the apparatus comprising a toolholder housing, a drive sleeve mounted for rotation to said toolholder housing, said drive sleeve having a borehole therethrough for engaging a lower end of the tool shaft [for rotating and oscillating the tool], said borehole having a cross section taken transversely to the axis of the filing tool which has a [constant-drive configuration] *circumferentially regularly fluted inner surface* for [rotating the tool while] permitting swinging movement of the tool, clamping means connected to the housing for clamping an upper end of the tool shaft against *rotation and* axial movement to the housing while permitting swinging movement [and rotation] of the tool, and drive means operatively connected to said drive sleeve for rotating said drive sleeve.

Re. 35,148

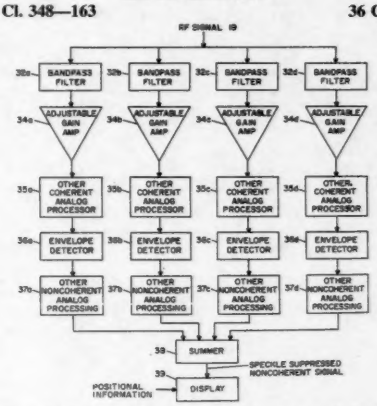
FREQUENCY DIVERSITY FOR IMAGE ENHANCEMENT

Frederic L. Lizzi, Tenafly, N.J.; Marek Elbaum, Dobbs Ferry, and Ernest J. Feleppa, Rye, both of N.Y., assignors to Riverside Research Institute, New York, N.Y.

Original No. 4,561,019, dated Dec. 24, 1985, Ser. No. 494,633, May 16, 1983. Application for reissue Jan. 20, 1995, Ser. No. 375,798

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—163 **36 Claims**



1. A method of reducing speckle in signals received from an object irradiated with finite-bandwidth, coherent pulses of any form of radiation that exhibits a wave nature comprising:

generating finite-bandwidth, coherent pulses and transmitting said pulses toward an object:

receiving the signals scattered by said object *to develop a broadband electrical signal* device [therefrom] *from said broadband electrical signal* separate, component, noncoherent signals, each representative of the components of said scattered signals in component frequency bands within said finite bandwidth; and

combining the component, noncoherent signals to obtain composite noncoherent signals, wherein the degradation of the signals due to speckle is less than in noncoherent signals derived directly from the original received signals.

PLANT PATENTS

GRANTED JANUARY 23, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,435

MINIATURE ROSE PLANT NAMED 'SAVADEN'

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Dec. 27, 1994, Ser. No. 364,500
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—10.1 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described.

9,436

'HAKKO' CHERRY TREE

Koichiro Konta, No. 131, Ooaza Dai, Kahoku cho, Nishi murayama gun, Yamagata pref., Japan

Filed Nov. 4, 1994, Ser. No. 337,458
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—37 **1 Claim**

1. A new and distinct variety of cherry tree, substantially as illustrated and described herein, particularly characterized by producing medium to large fruit of a vivid red color and an earlier flowering time than the known "Sato Nishiki" variety of cherry tree.

9,437

NECTARINE TREE 'LIZ'S LATE'

Chris F. Zaiger, 929 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 4005 California Ave., all of Modesto, Calif. 95358

Filed Dec. 12, 1994, Ser. No. 365,353
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—41.3 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is of large size, vigorous, upright in growth and a productive and regular bearer of large, firm, yellow flesh, freestone fruit with good flavor and eating quality; the fruit is further characterized by being nearly uniform in size throughout the tree, having good storage and shipping quality and, in comparison to August Glo Nectarine (U.S. Plant Pat. No. 8,039), the new variety matures in the same maturity season but is freestone instead of clingstone.

9,438

PEACH TREE 'AUTUMN FLAME'

James F. Doyle, 7685 N. Thompson Ave., Clovis, Calif. 93611-9016

Filed Jan. 10, 1995, Ser. No. 371,034
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—43.2 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, and which is somewhat similar in its harvesting date to the Carnival variety of peach tree (U.S. Plant Pat. No. 2,144) which matures in approximately the same season, and approximately a week later than the common commercial variety Fairtime (unpatented), but which is distinguished therefrom and characterized principally as to novelty, by producing fruit which are ripe for harvesting and shipment approximately September 4 through September 20 under the ecological conditions prevailing in the San Joaquin Valley of central California, the subject variety producing fruit which have an attractive exterior coloration, are freestone by nature, and further have a firm yellow-colored flesh.

9,439

AZALEA PLANT NAMED ATHENA

Frank C. Moser, Alva, Fla., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 31, 1995, Ser. No. 381,330
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinct cultivar of azalea named Athena, as described and illustrated.

9,440

CHRYSANTHEMUM PLANT NAMED 'HEATHER'

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers Inc., Barberton, Ohio

Filed Dec. 30, 1994, Ser. No. 366,498
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct Chrysanthemum plant named Heather, as described and illustrated.

9,441

CHRYSANTHEMUM PLANT NAMED 'WHITE BLUSH'

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 26, 1994, Ser. No. 296,467
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—82.1 **1 Claim**

1. A new and distinct Chrysanthemum plant named White Blush, as described and illustrated.

9,442

CHRYSANTHEMUM PLANT NAMED 'CORAL BLUSH'

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 26, 1994, Ser. No. 296,466
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—82.3 **1 Claim**

1. A new and distinct Chrysanthemum plant named Coral Blush, as described and illustrated.

PATENTS

GRANTED JAN. 23, 1996

ERRATA

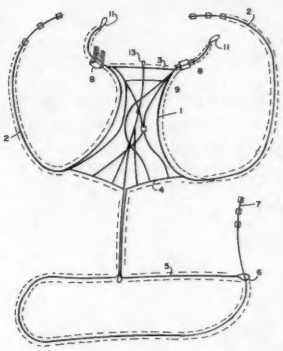
For CLASS	See PATENT NO.
029–718	5,485,660
056–294	5,485,718
126–025	5,485,816
126–409	5,485,829
126–512	5,485,830
227–178	5,485,952
403–322	5,486,056
452–058	5,486,145
216–091	5,486,234
216–033	5,486,263
264–154	5,486,273
369–288	5,486,437
501–137	5,486,491
552–521	5,486,626
327–174	5,486,758
348–211	5,486,852
348–222	5,486,853
356–073	5,486,904
369–013	5,487,046
369–032	5,487,047
315–276	5,487,088
382–133	5,487,112

PATENTS

GRANTED JANUARY 23, 1996

GENERAL AND MECHANICAL

5,485,636
RAPE PROTECTIVE DEVICE
Clifford N. Yandell, 2056 50th Ave., Vero Beach, Fla. 32966
Filed Dec. 27, 1994, Ser. No. 363,926
Int. Cl.[6] A41B *9/00*
U.S. Cl. 2—406 **12 Claims**



1. A protective undergarment for engaging both thighs and the waist of a wearer to prevent rape, the undergarment comprising:

(A) cable interconnected to form a crotch cover means for covering the anus and vulva of a wearer with a web having no openings large enough for penetration by a penis, the crotch cover means having two opposed sides and front and rear upper edges;

(B) a pair of cable clasp means for cable engaging, each one of said pair affixed to said crotch cover means at a junction of said front upper edge with one of said sides;

(C) a pair of elongate leg cables, having a free end and a fixed end, each one of said pair having the fixed end attached to said crotch cover means at a junction of said rear upper edge with one of said sides;

(D) said free end of each of said leg cables constructed for removably and length adjustably cooperating with one of said clasp means to snugly encircle a thigh while locking said leg cable within said clasp means to prevent loosening of the encirclement without disengaging said clasp means;

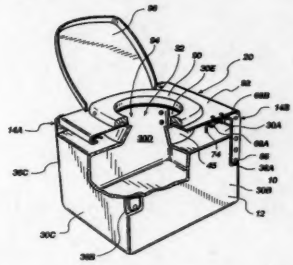
(E) an elongate waist cable attached at an intermediate point thereof to said rear upper edge of said crotch cover means by a cable, said waist cable having a noose at a first end for passage therethrough of a second end to thereby adjustably and snugly encircle the waist, the second end constructed for removably and length adjustably cooperating with one of said clasp means to lock the second end of the waist cable within said clasp means;

(F) locking means connected to said clasp means for preventing both of said clasp means from releasing said cables without the operation of said wearer; and

(G) in which said cable is flexible, cut-resistant and stretch-resistant.

5,485,637
HOLDING TANK FOR WASTE
John A. Green, 6895 S. 825 East, Midvale, Utah 84074
Filed Jul. 8, 1994, Ser. No. 272,029
Int. Cl.[6] A47K *11/04*
U.S. Cl. 4—483 **17 Claims**

1. A portable toilet comprising:



a tank formed of a plurality of walls defining an interior and provided with an aperture formed in a wall of the plurality of walls for accessing the interior;

a collar secured at a first edge to the wall to surround the aperture, the collar tapering along a collar surface a length in an axial direction and a span in a radial direction to a second edge of the collar;

a seat selectively attachable to be supported by the tank and having all opening positionable to register with the aperture for supporting a user;

a cap comprising a band projecting from a bulkhead, the band having a band surface formed to sealingly fit against the collar surface for sealing the aperture against passage of liquids, the band being selectively positionable on the collar to be spaced from the tank to contact the collar only on the collar surface intermediate the top edge and the bottom edge;

a funnel sealably securable to the collar for draining the tank through the aperture; and

a support attached to the tank and engaged by a latch mechanism for fastening selectively the seat, the cap and the funnel to the collar.

5,485,638
SELF LOCKING FUTON FRAME
John H. Newton, 7 Tigertown Rd., White River Jct., Vt. 05001
Filed May 25, 1994, Ser. No. 248,884
Int. Cl.[6] A47C *17/17*
U.S. Cl. 5—37.1 **21 Claims**

1. A futon frame for supporting a futon forming a chair or sofa when the futon frame is in a closed position and forming a bed when the futon frame is in an open position, the futon frame comprising:

a base having a first end with a first base end slot and a second end with a second base end slot;

a back having a first back side member and a second back side member;

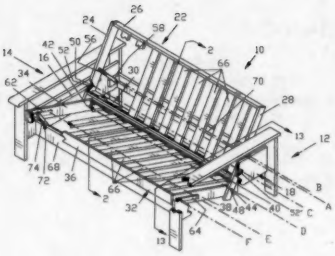
a first back pivot pin attaching to said first back side member and slidably engaging said first base end slot;

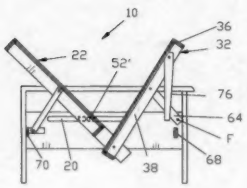
a second back pivot pin attaching to said second back side member and slidably engaging said second base end slot;

a first back support pivotably attaching to said first back side member and to said base;

a second back support pivotably attaching to said second back side member and to said base;

a seat having a first seat side member and a second seat side member, said seat pivotably attaching to said back;





a first seat support pivotably attaching to said first seat side member and to said base; and

a second seat support pivotably attaching to said second seat side member and to said base.

5,485,639

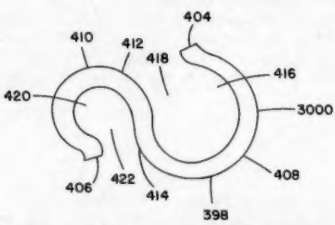
MODULAR INNERSPRING AND BOX SPRING ASSEMBLIES

Frank G. Cavazos, 14040 Shoshoni Dr., Lockport, Ill. 60441

Continuation-in-part of Ser. No. 203,100, Feb. 28, 1994. This application Jun. 6, 1994, Ser. No. 254,735

Int. Cl.[6] A47C *23/04*

U.S. Cl. 5—259.1 **12 Claims**



1. A mattress spring clip comprising a unitary strip of material having a spring bias characteristic, said unitary strip having a first side edge, a second side edge spaced apart from said first side edge to define a relatively wide wall therebetween, a first end an an opposite second end, said unitary strip curving arcuately in a clock-wise direction from said first end to a first loop entrance point of said unitary strip substantially opposite from and spaced apart a pre-determined distance from said first end to define a first loop entrance therebetween having a first loop entrance space, a first loop pocket formed by said unitary strip curving arcuately in a clock-wise direction from said first end to said first loop entrance point of said unitary strip, said unitary strip curving arcuately in a counterclock-wise direction from its said first loop entrance point to said second end, a second loop entrance point of said unitary strip substantially opposite from and spaced apart a pre-determined distance from said second end to define a second loop entrance therebetween having a second loop entrance space and a second loop pocket formed by said unitary strip curving arcuately in a counterclock-wise direction from its said first loop entrance point to said second end, said first end of said unitary strip of material having said spring bias characteristic being movable against said spring bias away from its said spaced apart pre-determined distance from said first loop entrance point when flexing pressure is applied thereto and returnable to said predetermined spaced apart distance when said flexing pressure is released, said second end of said unitary strip of material having said spring bias characteristic being movable against said spring bias away from its said spaced apart pre-determined distance from said second loop entrance point when flexing pressure is applied thereto and returnable to said pre-determined spaced apart distance when said flexing pressure is released.

5,485,640

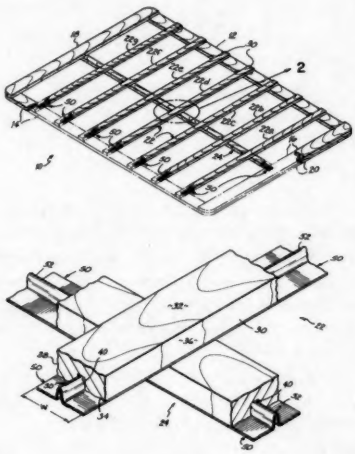
BEDDING FOUNDATION FRAME

Joe C. Workman, Carthage, Mo., assignor to L&P Property Management Company, Chicago, Ill.

Filed Aug. 4, 1994, Ser. No. 285,996

Int. Cl.[6] A47C *23/05*

U.S. Cl. 5—263 **12 Claims**



12. A frame for a bedding foundation, comprising:

a pair of opposed side rails and a pair of opposed end rails formed into a rectangular configuration;

a plurality of wooden slats extending between said side rails in spaced parallel relation to one another and to said opposed end rails, said wooden slats each having a top face, a bottom face, and opposed side walls of less height than the width of said top and bottom faces;

at least one of said wooden slats having a longitudinally extending slot in the center said bottom face;

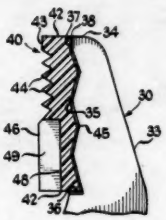
a sheet metal strip of a thickness substantially less than the height of said wooden slats having a normally planar portion, said strip having an upstanding longitude flange formed in the center portion of said strip; and

said planar portion of said strip being in juxtaposition to the bottom face of said least one of said wooden slats with the flange of said strip extending upwardly into the slot of said at least one of said wooden slats, said at least one of said slats and said strip together bending when a normal load is placed on said frame, but with the strip providing additional resistance to bending of said at one of said wooden slats under normal loads and preventing breakage said at least one of said wooden slats under abnormal loads.

5,485,641
COMPOSITE/PLIER CUTTER TOOL WITH SHEAR ACTION CUTTER INSERT

Paul M. Machmeier, Racine; Gregory A. Zurbuchen, and Paul B. Lemens, both of Kenosha, all of Wis., assignors to Snap-on Incorporated, Kenosha, Wis.

Continuation of Ser. No. 137,367, Oct. 18, 1993, abandoned. This application Dec. 9, 1994, Ser. No. 352,431
Int. Cl.[6] B25B *7/22*
U.S. Cl. 7—134 **6 Claims**

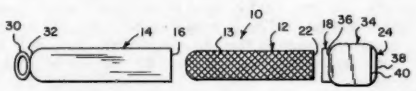


1. A non-electrically conductive and non-sparking pivoting cutter/plier hand tool comprising: first and second lever members respectively having cooperating jaws at adjacent ends thereof and each formed entirely of plastic material, a pivot mechanism having no exposed metallic portions pivotally interconnecting said lever members in intersecting relationship for pivotal movement between open and closed conditions of said jaws, first and second ceramic cutter inserts formed of transformation toughened zirconia (TTZ), and an adhesive fixedly securing said inserts respectively to said jaws in opposed relationship, said inserts respectively having first and second substantially parallel cutting surfaces disposed for movement in shearing relationship with each other when said jaws are moved from the open to the closed condition thereof, each of said inserts having a recessed surface intersecting the associated cutting surface at one end thereof and a retaining surface intersecting said cutting surface at an opposite end thereof to define a cutting edge.

5,485,642
PURSE FILE WITH POP TOP OPENER

Patsy A. Wiggleton, 4718 Laura, Midland, Tex. 79703, and George Spector, 233 Broadway Room 702, New York, N.Y. 10279

Filed Mar. 17, 1995, Ser. No. 406,122
Int. Cl.[6] B25F *1/00*
U.S. Cl. 7—151 **4 Claims**



1. A nail file and pop top opener comprising:

a) a nail file blade having abrasive surfaces on opposite sides for filing and trimming fingernails;

b) a case having an open end to retain said nail file blade therein when not in use, so as to be carried in a purse;

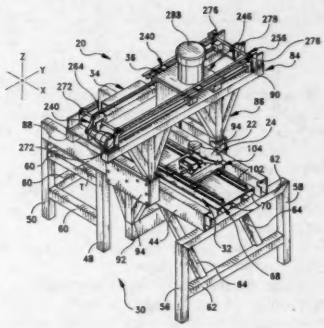
c) a sleeve having a slot therein to engage in a removable manner with one end of said nail file blade extending from said open end of said case; and

d) a pop top can opener affixed to said sleeve, so that when said sleeve is in engagement with said one end of said nail file blade and said nail file blade is placed within said case, said pop top can opener could be maneuvered to lift up a pop top on a soft drink can thereby preventing breakage of fingernails.

5,485,643
APPARATUS AND PROCESS FOR TRIMMING A SOLE OF A SHOE

Eric Beenfeldt, Orono, and Richard O. Eason, Bangor, both of Me., assignors to Dexter Shoe Company, Dexter, Me.

Filed Aug. 1, 1994, Ser. No. 284,009
Int. Cl.[6] A43D *8/32;21/00;93/00;8/00*
U.S. Cl. 12—85 **32 Claims**



1. An apparatus for trimming a sole of a shoe having a shoe upper, said sole being attached to the shoe upper, said apparatus having members that are movable in at least three directions of movement along an x axis, a y axis and a z axis, said apparatus comprising:

a support structure;

a shoe carriage mounted on said support structure, said shoe carriage being constructed and arranged for mounting a shoe thereon and being movable back and forth along the x axis and up-and-down along the z axis;

a sensing station mounted on said support structure, said sensing station comprising means for detecting the exact outline of the shoe upper with respect to the sole;

a cutting station mounted on said support structure for trimming the sole of the shoe with a first cutter, the first cutter being movable side-to-side along the y axis; and

means for controlling the movement of the carriage between a starting position, the sensing station, the cutting station and back to the starting position and for controlling the operation and movement of the first cutter for trimming the sole of the shoe when the shoe is in the cutting station in accordance with the information as detected at the sensing station.

5,485,644
SUBSTRATE TREATING APPARATUS

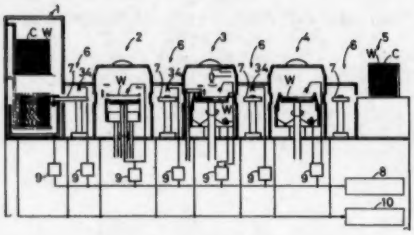
Kaoru Shinbara; Yasuhiro Kurata, and Masashi Sawamura, all of Shiga, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Mar. 17, 1994, Ser. No. 210,177
Claims priority, application Japan, Mar. 18, 1993, 5-058150; Mar. 18, 1993, 5-058151; Mar. 18, 1993, 5-058152; Mar. 18, 1993, 5-058153; Mar. 18, 1993, 5-058154
Int. Cl.[6] H01L *21/304;* **B08B** *11/02;* **A46B** *13/04*
U.S. Cl. 15—21.1 **22 Claims**

1. A substrate-treating apparatus for treating opposite surfaces of each of a plurality of substrate plates in a process of preparing the plates for industrial use, wherein the plates are retrievable from a substrate storage where the substrate plates are disposed in a vertical stack, the substrate-treating apparatus comprising:

a substrate soaking section for soaking said substrate storage in a substrate surface-treating liquid;

a first substrate-treating section for carrying out a first substrate-treating process applying surface-treating liquid onto a substrate retrieved from said substrate storage;



a first substrate-transporting section disposed between said substrate soaking section and said first substrate-treating section, including first surface-treating liquid applying means for applying surface-treating liquid to said substrate;

said substrate storage comprising a housing having a lateral opening as a passage for retrieval of said substrate plates from said vertical stack; and

said substrate soaking section comprises:

a tank for soaking said substrate storage, containing said substrate surface-treating liquid;

storage lifting means for vertically moving said substrate storage when soaking in said tank; and

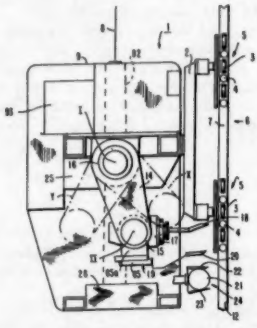
current flowing means for forming a current at least superficially in the substrate surface-treating liquid in said tank, said current flowing from said lateral opening of the substrate storage housing in a rearward direction of said substrate soaking section.

5,485,645

OUTER WALL CLEANING ROBOT

Shigeru Ohtsuki, Tokyo, Japan, assignor to Nihon Biso Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1994, Ser. No. 270,906
Claims priority, application Japan, Jan. 20, 1993, 5-285897
Int. Cl.[6] A47L *1/02*
U.S. Cl. 15—103 **6 Claims**



1. An outer wall cleaning robot for cleaning a vertical outer wall surface of a building, comprising:

an arm pivotable about a first rotation axis that extends in a substantially horizontal direction in approximately parallel relation to the vertical outer wall surface of the building when in use;

an arm driving mechanism connected to said arm for driving said arm to pivot about the first rotation axis;

a rotational body supported by said arm in such a manner that said rotational body is pivotable about a second rotation axis extending in parallel with said first rotation axis;

a rotational-body driving mechanism for driving said rotational body independently of driving of said arm by said arm driving mechanism;

a wiping-squeegee mounting mechanism operably connected to said rotational body; and

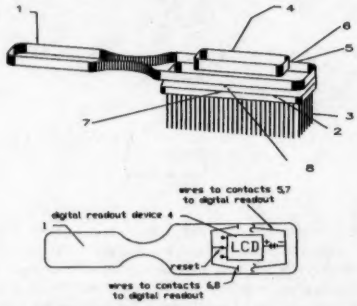
a wiping squeegee attached to said mounting mechanism.

5,485,646

HAIRBRUSH WITH ELECTRONIC STROKE COUNTER

Robert L. Merritt, 4274 Catcerrk Rd., Valdosta, Ga. 31602

Filed Sep. 6, 1994, Ser. No. 301,076
Int. Cl.[6] A46B *9/04;7/06*
U.S. Cl. 15—105 **1 Claim**



1. A brush for brushing of hair, said brush comprising:

a flat, elongated handle having opposite ends, first and second opposing sides and first and second opposing edges, said handle having an elongated, flexible spring member substantially parallel therewith and extending laterally from said first side of said handle adjacent one end thereof, said spring member having an enlarged free edge and positioned intermediate said edges, a pair of spaced electrical contacts are mounted on said first side of said handle with said spring member positioned therebetween;

a flat, elongated base having first and second opposing sides and first and second opposing edges, said base having bristles extending from said first side thereof, said base having an elongated slot formed in the second side thereof intermediate said first and second edges of said base, a pair of spaced electrical contacts mounted on said second side of said handle with said slot positioned therebetween, said slot receiving the enlarged free edge of the spring member of said handle to couple the handle and base such that said base can swing relative to said handle in opposing directions during stroking of hair, the electrical contacts of the base being aligned with those of the handle such that upon swinging of the base in each direction, one of the contacts of the base engages one of the contacts of the handle;

an electronic digital read out means having a liquid crystal display mounted on the second side of said handle, said means is electrically coupled via wires to all of said electrical contacts such that as the brush is used to stroke hair, the digital read out means indicates the number of strokes achieved.

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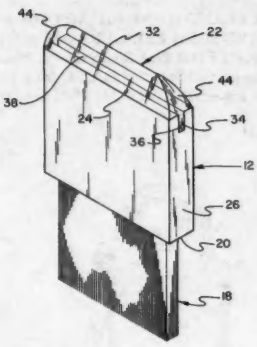
SPORTING EVENT SCRAPER BRUSH

Larry Durst, 1139 Bunkerhill Dr., Troy, Ohio 45373

Filed Oct. 26, 1994, Ser. No. 329,285
Int. Cl.[6] A47L *25/00*
U.S. Cl. 15—111 **1 Claim**

1. A sporting event scraper brush comprising:

a handle for grasping and manipulating by an individual, said handle comprising a substantially rectangular handle block having a front face spaced from and parallel to a rear face, with a pair of lateral end faces extending orthogonally



between said front and rear faces, a first end of said handle being defined by a bottom face extending substantially orthogonally relative to said front face and said lateral end faces, with a second end of said handle being defined by a top face extending spaced from and substantially parallel to said bottom face so as to define a substantially rectangular shape of said handle block, said handle block being shaped so as to define a mounting groove extending from a first one of said lateral end walls across the top wall and terminating at a second one of said lateral end walls, the mounting groove extending through both of the lateral end walls;

a brush means extending from said first end of said handle for brushing loose dirt and debris from a surface; and,

a scraping means extending from said second end of said handle for scraping and mechanically removing attached dirt and debris from said surface, said scraping means comprising a scraping block secured to a top face of said handle block, said scraping block being shaped so as to define a planar front face which extends from said top face of said handle block at an oblique angle relative thereto, a planar rear face projecting from said tip face of said handle block and intersecting said planar front face of said scraping block, said front and rear faces being oriented at an oblique angle relative to one another and cooperating to define a scraping apex which can be utilized to mechanically engage and scrape said surface, said scraping block being further shaped so as to define respectively opposed arcuate lateral faces which extend from said top face of said handle block to intersect both said front and rear faces to define opposed pairs of arcuate lateral scraping apexes, wherein said arcuate lateral apexes can be utilized to clean an arcuate surface, said scraping block including an elongated longitudinal projection received within the mounting groove extending along the top face of the handle block, the longitudinal projection being frictionally and removably retained within the mounting groove so as to permit for selective removal of the scraping block from the handle block.

5,485,648

COVERING FOR THE PARTIALLY COATING OF ARTICLES SUCH AS BROOM BACKS AND ARTICLES SUCH AS BROOM BACKS SO COVERED

Sergio Balducci, 590 Via Fiorentiana, 50132 Bottegone (Pistoia), Italy, and Roberto Giraldi, Prato, Italy, assignors to Sergio Balducci, Via Fiorentina, Italy

Filed Jun. 16, 1994, Ser. No. 175,402

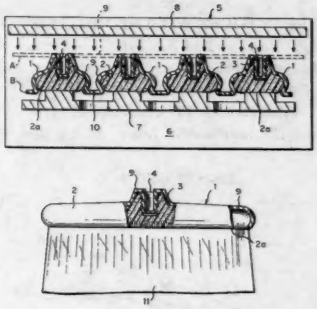
Claims priority, application Italy, Jul. 9, 1991, FI91A0171

Int. Cl.[6] A46B *5/00*

U.S. Cl. 15—175 **4 Claims**

1. A broom head comprising:

(a) an elongated broom back having an upper face, a lower face with plurality of bristles projecting therefrom and side faces



extending between the upper and lower faces; a support extending from a central portion of the upper face, said support having a threaded seat therein for enabling attachment of the broom back to a handle, said threaded seat being defined by a side wall extending about its periphery and a closed end wall spaced from said lower face; and

(b) a layer of thermoformed plastic material completely covering, closely engaging and conforming to the upper face, side faces, the support and the side wall and end wall of the threaded seat, said plastic layer further having a lower cut bent edge partially covering the lower face.

5,485,649

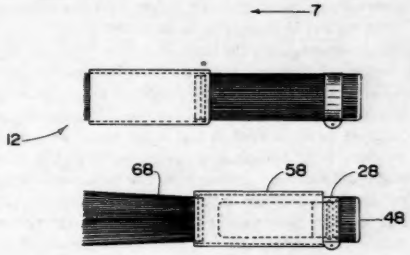
BEACH BRUSH

Gary L. Micell, 39 Scout La., Hummelstown, Pa. 17036

Filed Mar. 16, 1990, Ser. No. 494,307

Int. Cl.[6] A46B *7/00*

U.S. Cl. 15—184 **22 Claims**



1. A brush for removal of dirty matter off of humans and animals comprising:

a) plurality of bristles, in substantially parallel relation to each other;

b) handle for supporting the ends of said bristles, said handle having an outer surface, a forward end where said bristles are supported, and a back end;

c) cover means of substantially smooth surface and located circumferentially around said handle and able to move back and forth over said handle so that said cover means may enclose varying lengths of said bristles, said cover means having a forward end and a back end;

d) grooves located substantially around the outer surface of said handle, said grooves parallel to each other and running from said forward end to said back end of said handle so that said grooves form a series of corresponding upraised parallel ridges in said handle, said ridges becoming gradually more upraised in the direction of said forward end of said handle, said ridges capable of fitting tightly against said cover so that said cover may be held in place at various positions along the length of said handle.

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WINDSCREEN WIPER WITH ELONGATED, CURVED BACKBONE

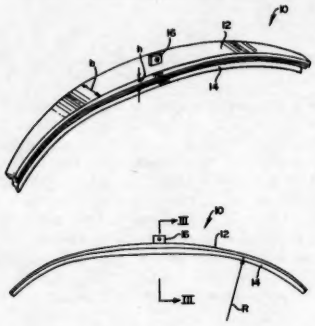
Adriaan R. Swanepoel, Pretoria, South Africa, assignor to Adriaan Retief Swanepoel, South Africa

Filed Oct. 19, 1993, Ser. No. 137,769

Claims priority, application South Africa, Jan. 23, 1992, 92/8225

Int. Cl.[6] B60S 1/38

U.S. Cl. 15—250.43 10 Claims



1. A windscreen wiper which includes

an elongate backbone which is curved in a plane, is of a resiliently flexible material and which has a connecting formation at a portion intermediate its length for connection to a displacing and force applying member; and

a wiper blade attached to the backbone;

the backbone having first and second longitudinal ends and a mounting surface defined along the length thereof from said first longitudinal end to said second longitudinal end, said backbone being secured to said wiper blade, said curved backbone being substantially coextensive with said wiper blade, said backbone having a transverse cross-sectional profile defining a thickness and a width thereof, the thickness of said backbone being greatest at said intermediate portion and gradually decreasing along at least a first portion of said backbone, which is defined between said connecting formation and said first longitudinal end,

the backbone having a free-form curved profile in a plane, whereby the backbone defines an x–y plane, a z-axis extending perpendicularly from the x–y plane;

the backbone having a suitably varying cross-sectional profile along its length and a suitable free-form curvature, such that a double integral Z_T is less than 1.0 mm, where

$$z_T = \int_0^l \sin\left[\int_0^x \frac{I_{zz}(x)}{R(x)\, I_{yy}(x)}\, dx\right] dx$$

where l is a cantilever length of the backbone from the connecting formation to the first longitudinal end of the backbone and $I_{zz}(x)$ is the moment of inertia about the z-axis at a position x along the backbone from the connecting formation, R(x) is the radius of curvature of the backbone at position x expressed in metres, and $I_{yy}(x)$ is the moment of inertia about the y-axis at position x.

5,485,651

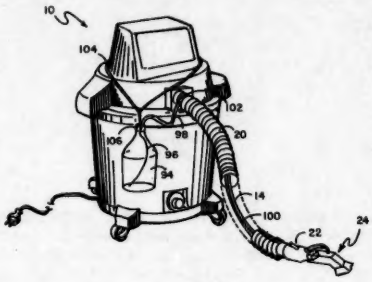
VACUUM CLEANING AND SHAMPOOING SYSTEM HAVING HIGH-PRESSURE AIR MEANS

Daniel R. Payeur, 66 Old Post Rd., Sanford, Me. 04073

Continuation-in-part of Ser. No. 243,258, May 16, 1994, abandoned. This application Mar. 31, 1995, Ser. No. 415,174

Int. Cl.[6] A47L 5/14

U.S. Cl. 15—321 8 Claims



1. A vacuum cleaning system for cleaning a surface, said system of the type having: a vacuum cleaner producing a suction; a vacuum hose member having a diameter, a length, a first end connected to said vacuum cleaner and a second end, wherein the improvement comprises:

a nozzle member having an axis, an open first end, an open second end defining a mouth, said second end having a linear direction along its axis and a front side, a rear side, a first side, and a second side;

a collar member having an exterior surface, a first end and a second end, said first end of said collar member interconnected to said second end of said vacuum hose member, said second end of said collar member being of a shape to receive said first end of said nozzle member thereon;

means to produce high-pressure air;

a flexible air pressure hose having a diameter, a first end and a second end, said diameter of said air pressure hose being substantially smaller than said diameter of said vacuum hose member, said air pressure hose engaged at its first end to said means to produce high-pressure air to carry said high-pressure air therethrough;

a hose receipt aperture defined in said first end of said vacuum hose member, said hose receipt aperture receiving said second end of said air pressure hose therethrough, said air pressure hose extending inside said vacuum hose member along its length;

a valve member disposed within said collar member, said valve member having a first end and a second end, said valve member having an inlet defined at its first end and an outlet defined at its second end;

means to engage said air pressure hose to said inlet of said valve member at said second end of said vacuum hose member;

means to manually activate said valve member to either an "on" open mode or to an "off" closed mode, said activation means positioned on said exterior surface of said collar member;

a nozzle high-pressure air line having a first end and a second end, said nozzle high-pressure air line extending within said nozzle member from said first end of said nozzle member to said second end of said nozzle member;

means to engage said first end of said nozzle high-pressure air line to said outlet of said valve member at said second end of said collar member;

a high-pressure air outlet member disposed within, and transverse to, said mouth of said nozzle member, said high-pressure air outlet member having a first end and a second end, said high-pressure air outlet member having at least one outlet aperture defined therein facing outwards from said mouth of said nozzle member in the direction of said axis of said nozzle member; and

said nozzle high-pressure air line interconnected to said high-pressure air outlet member, said system, when said valve member is activated to its "on" position, to direct said high-pressure air from said means to produce high-pressure air, through said air pressure hose, through said valve member, through said nozzle high-pressure air line, through said high-pressure air outlet member, and through said outlet aperture to direct said high-pressure air out said mouth of said nozzle member against said surface being cleaned at the same time that said vacuum cleaner is sucking air through said mouth of said nozzle member, through said collar member and through said vacuum hose member into said vacuum cleaner.

5,485,652

SUCTION CLEANING HEAD

John A. Holland, Winthrop, Australia, assignor to VAX Appliances Ltd., United Kingdom

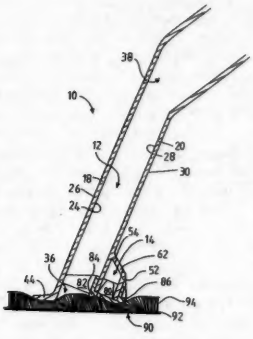
PCT No. PCT/AU91/00448, § 371 Date Mar. 4, 1993, § 102(e) Date Mar. 4, 1993, PCT Pub. No. WO92/05735, PCT Pub. Date Apr. 16, 1992

PCT Filed Oct. 2, 1991, Ser. No. 987,268

Claims priority, application United Kingdom, Jan. 2, 1990, 9021388; Australia, Mar. 20, 1991, PK5188; Mar. 25, 1991, PK5251

Int. Cl.[6] A47L *11/30;7/00*

U.S. Cl. 15—322 **24 Claims**



1. A suction cleaning head, comprising:

a suction chamber having an open mouth and an outlet connectable to an air extractor;

a cleaning liquid chamber positioned externally to said suction chamber and having an open mouth and an inlet connectable to a supply of cleaning liquid, the cleaning liquid being flowable through said cleaning liquid chamber; and

means for restricting the flow of the cleaning liquid through said cleaning liquid chamber, comprising:

a closure releasably engaging and at least partially closing the open mouth of said cleaning liquid chamber; and

a plurality of passageways formed at least in part by said closure, said passageways being in communication with said cleaning liquid chamber and enabling the cleaning liquid to flow from said cleaning liquid chamber at a rate restricted by a dimension and number of the passageways.

5,485,653

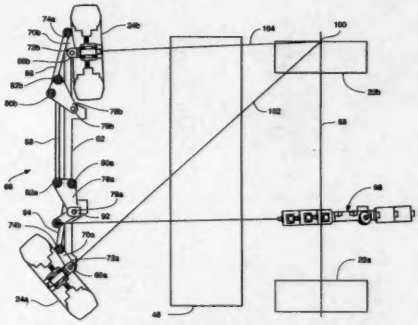
FLOOR CLEANING APPARATUS

Christopher M. Knowlton, Pinehurst, N.C.; Robert J. O'Hara, Castle Rock, Colo., and Timothy A. Strickland, Raeford, N.C., assignors to Windsor Industries, Inc., Englewood, Colo.

Filed Apr. 25, 1994, Ser. No. 233,014

Int. Cl.[6] A47L *5/30*

U.S. Cl. 15—340.4 **50 Claims**



1. A apparatus for cleaning a surface comprising:

a frame;

means, operatively attached to said frame, for cleaning a surface;

four wheels for use in moving said frame and said means for cleaning over a surface, wherein each of said four wheels is operatively connected to said frame and said four wheels includes a first pair of non-steerable wheels and a second pair of steerable wheels; and

means for steering said second pair of wheels that, when used to turn said second pair of wheels, can cause at least one of said second pair of wheels to turn more than about 45° so that tight turns can be made by the apparatus;

wherein said means for steering includes the following:

a first wheel arm that is operatively connected to one of said second pair of wheels and rotatable about a first wheel pivot point;

a second wheel arm that is operatively connected to the other of said second pair of wheels and is rotatable about a second wheel pivot point that is different than said first wheel pivot point;

a first steering arm that is rotatable about a first steering pivot point;

a second steering arm that is rotatable about a second steering pivot point that is different than said first steering pivot point;

a first link pivotally connected to said first wheel arm and said first steering arm;

a second link pivotally connected to said second wheel arm and said second steering arm; and

a third link pivotally connected to said first steering arm and said second steering arm.

5,485,654

SPACECRAFT HANDLE

Robert P. Nespodzany, Jr., Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 15, 1994, Ser. No. 340,499

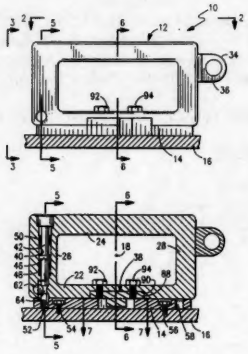
Int. Cl.[6] A47B *95/02*

U.S. Cl. 16—114 R **7 Claims**

7. A handle assembly comprising:

a baseplate having a slot with sidewall inner bearing surfaces;

a handle unit having a bar with an axis and with diametrically opposite flange outer bearing surfaces engaging the inner bearing surfaces;



lock means for locking the handle unit to the baseplate; and release means for unlocking the lock means.

5,485,655

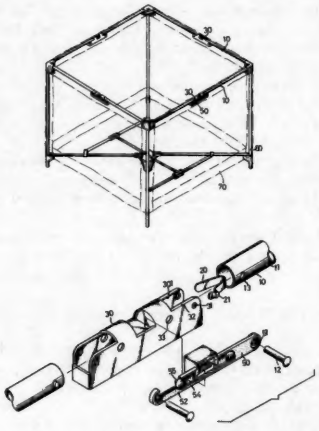
HINGE DEVICE FOR ARMRAILS OF A PLAYPEN

Kun Wang, No. 51, Lane 31, Sec. 2, Changping Rd., Taichung, Taiwan, Prov. of China

Filed Jan. 20, 1995, Ser. No. 375,625

Int. Cl.[6] E05D *11/10;* A47D *7/00*

U.S. Cl. 16—371 **3 Claims**



1. A hinge device for armrails of a playpen, said playpen having a plurality of armrails each composed of at least one pair of rods pivotally coupled by a hinge, said hinge being a U-shaped element having two open ends defined by two side walls, each side wall having a first hole and a second hole defined therein and each open end of said hinge having a cut-away defined in an upper portion thereof and communicating with said open end;

at least one plate having two slender arms engaged to a lateral side of said hinge, each slender arm having an engaging hole defined in a distal tip thereof and fixedly engaged to said plate, a finger having a first end extending integrally and longitudinally from each said slender arm and a second end having a boss extending laterally therefrom corresponding to said second hole of said hinge;

each rod of said armrail having a bore defined by a periphery in which a third hole and a fourth holes are laterally defined, said rod pivotally received in said open end of said hinge by a rivet extending through said engaging hole of said plate, said first hole of said hinge and said third hole of said rod, a biasing element received in said bore of said rod and having a protrusion extending therefrom and extending through said fourth hole of said rod and said second hole of said hinge and corresponding to said boss of said finger such that said second end of said finger can be pushed forward to said protrusion to eject said protrusion from said second hole of said hinge by said boss to allow said rod to be pivoted about an axis of said rivet and received in said cut-away of said hinge.

5,485,656

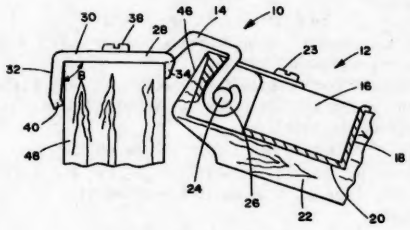
HINGE FOR MOUNTING A DOOR ON A FRAME

Georg Domenig, Kernersville, N.C., assignor to Grass America, Inc., Kernersville, N.C.

Filed Aug. 10, 1994, Ser. No. 288,446

Int. Cl.[6] E05D *5/02*

U.S. Cl. 16—387 **6 Claims**



1. A hinge for mounting a door on a frame comprising: a hinge arm receiver mountable on one of the door and the frame; a hinge arm having first and second ends, the first end connected to the hinge arm receiver and the second end having a hinge plate mountable on the other of the door and frame and receivable by said other of the door and frame in pre-mounting and mounted positions, the hinge plate having a depending ledge with a terminus portion engageable by said other of the door and frame, said terminus portion being engageable in said pre-mounting position by frictional contact between said terminus portion and said other of the door and frame, said one of the door and frame being supportable on said mounted hinge arm receiver and said frictional contact being maintained by a pulling force exerted on said hinge arm transmitted through the connected hinge arm receiver supporting said one of the door and frame, said hinge plate having a top with portions defining at least one hole for receiving a fastening screw, said hinge plate being moveable from said pre-mounting position to said mounted position by fastening said received fastening screw to said other of said door and frame, said terminus portion of said depending ledge being configured as a bent portion of the depending ledge, and said depending ledge defining an angle with said hinge plate top which is greater than about 90 degrees.

5,485,657

GARMENT HANGING CLIP AND METHOD OF USING THE SAME

Chung B. Kim, 1441 Creekside Dr., #325, Walnut Creek, Calif. 94596

Filed May 11, 1994, Ser. No. 240,995

Int. Cl.[6] A41F *1/00*

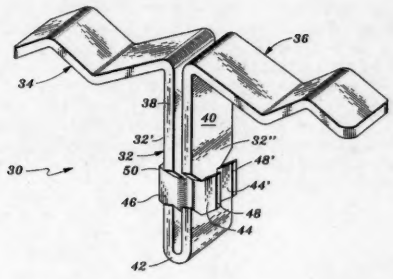
U.S. Cl. 24—543 **9 Claims**

1. A garment hanging clip, comprising:

an elongated central portion having a first major face and a second major face opposite said first major face;

a first plurality of prongs projecting outwardly from said first major face;

a second plurality of prongs projecting outwardly from said second major face;



a first wing portion extending outwardly from said elongated central portion;

a second wing portion extending outwardly from said elongated central portion;

said first wing portion being manually bendable into confronting relation with said first plurality of prongs, and continuing to confront said first plurality of prongs after the manually applied bending force is no longer applied; and

said second wing portion being manually bendable into confronting relation with said second plurality of prongs, and continuing to confront said second plurality of prongs after the manually applied bending force is no longer applied.

5,485,658

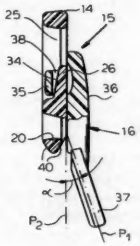
GARMENT CLOSURE

Gerhard Fildan, Kriehburgergasse 31, A-1050 Vienna, Austria

Filed May 23, 1994, Ser. No. 247,667

Int. Cl.[6] A44B *11/00*

U.S. Cl. 24—614 **8 Claims**



1. A closure for a maternity brassiere, comprising:

a flat link lying in a plane and having an upper bar engageable by a brassiere support strap, a lower bar connectable to a breast cup of the brassiere by a fabric loop, a window formed in said link between said bars, and a wedge-shaped tongue projecting into said window; and

a connecting member releasably engageable with said flat link and having a plate dimensioned substantially to cover said window and said tongue when said connecting member is engaged with said link, a stirrup formed on an inner surface of said plate, engageable in said window and receiving said tongue, and a planar extension connected to said plate and inclined thereto, said extension being formed with a bar connectable to a loop of a brassiere flap covering an opening in said cup through which a nipple of a wearer can be exposed upon disengagement of said stirrup from said tongue, said plate has a configuration of a shield, said tongue being disposed between a pair of flanks spaced from the tongue to receive opposite sides of said stirrup between said tongue and said flanks, said flanks being formed with inwardly extending detents limiting inadvertent slippage of said stirrup from said tongue.

5,485,659

BUCKLE FOR WATCH BANDS

Junsuke Kashikie, and Hideo Taguchi, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

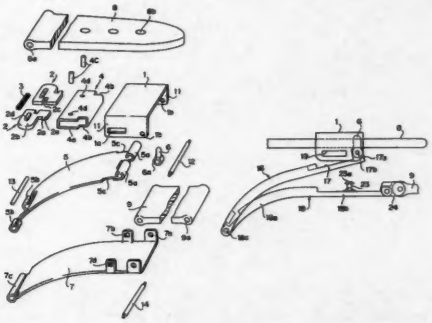
PCT No. PCT/JP94/00481, § 371 Date Nov. 25, 1994, § 102(e) Date Nov. 25, 1994, PCT Pub. No. WO94/22340, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 25, 1994, Ser. No. 338,513

Claims priority, application Japan, Mar. 26, 1993, 5-019744 U; Mar. 15, 1994, 6-043543

Int. Cl.[6] A44C *5/00*

U.S. Cl. 24—71 J **5 Claims**



1. A buckle for watch bands having a first band member having a plurality of adjusting holes and a second band member, the buckle including a cover having opposite side plates, each of which has an opening, a middle plate rotatably connected to an end of said cover at a longitudinal first end thereof, and a bottom plate rotatably connected to a second end of said middle plate at one of longitudinal ends thereof, the buckle comprising

a guide housing disposed in an inside of said cover;

a space formed between an upper plate of the guide housing and an inside wall of the cover in which the first band member is inserted and supported;

a pair of push plates slidably mounted in said guide housing so as to be slid in the lateral direction with respect to the longitudinal direction of the bands;

a spring provided between the push plates for outwardly urging the push plates respectively;

stopping means for stopping each of the push plates at a position where an outer end portion of the push plate is projected from the opening of the side plate of the cover so as to be operated by a finger of a wearer;

each push plate having an engaging projection and a slant formed on the underside of the engaging projection;

a tongue rotatably mounted on the first end of the middle plate to be engaged with the adjusting hole of the first band member; and

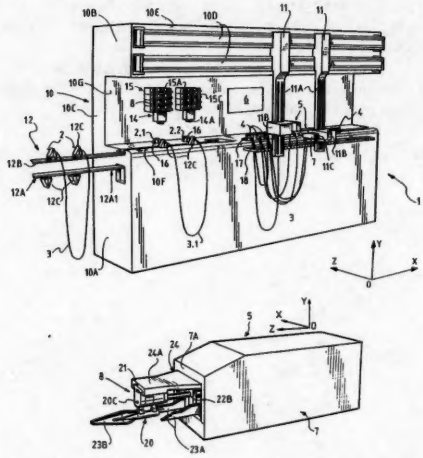
at least one engaging lug formed on said bottom plate to be projected to the push plates;

the engaging lug being arranged such that a part of the lug is engaged with said slant of the push plate so as to inwardly move the push plate due to the inclination of the slant when the bottom plate is pivoted toward the cover, and that the engaging lug engages with the engaging projection when passing the slant.

5,485,660
MACHINE FOR CONNECTION CONNEXION ELEMENTS INTO CONNECTORS

Serge F. Pittau, Aubagne, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Division of Ser. No. 945,623, Sep. 16, 1992, Pat. No. 5,333,374. This application Apr. 22, 1994, Ser. No. 231,114
Claims priority, application France, Sep. 26, 1991, 91 11867
Int. Cl.[6] B23P *21/00;* **H01R** *43/20*
U.S. Cl. 29—718 **6 Claims**



1. A machine for automatically inserting connexion elements of electrical conductors of cables into connector housings, which comprises:

(a) at least two connecting devices (**5**) each of which includes (i) a body (**7**) which can be displaced toward corresponding housing of a connector (**4**), (ii) at least one insertion member (**8**) provided with means (**20**) for grasping a connexion element (**2**) to be inserted into the corresponding housing (**4A**) of the connector, (iii) means (**21**) for fixing said at least one insertion member to said body, allowing locking or unlocking of said at least one insertion relative to said body, (iv) means (**22**) for controlling said grasping means (**20**), associated with said body and capable of assuming, when said insertion member (**8**) is locked, a first position, in which said grasping means (**20**) holds said connexion element (**2**) and enables it to be inserted into the corresponding housing of the connector, and a second position, in which the grasping means releases said connexion element which is then connected in the connector housing, (v) said fixing means (**21**) being removable and comprising a tenon (**21A**) and mortise (**21B**) assembly allowing said insertion member (**8**) to slide on the body (**7**), and a ball lock (**21C**) enabling the insertion member to be immobilized in position relative to said body, said at least two connecting devices (**5**) intended to deal respectively with the two connexion elements (**2**) provided at the ends of each cable (**3**), the body (**7**) of each device intended to carry said insertion member (**8**), being capable of being displaced, relative to a frame (**10**) of the machine, along the OX, OY and OZ axes of an orthonormal reference system;

(b) a plurality of connectors (**4**), the housings (**4A**) of which are intended to receive the corresponding connexion elements, and which are placed on said frame;

(c) means (**14**) for visualizing the positions of the connexion elements (**2**) equipping the respective ends of each cable;

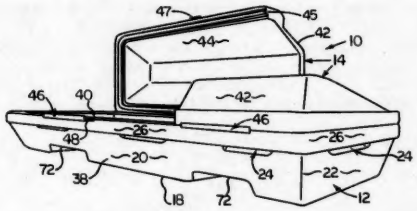
(d) an area (**15**) for storing the various insertion members which are capable of being locked to said respective bodies, and which are selected as a function of the geometrical characteristics of said connexion elements to be connected; and

(e) a programable directing unit (**6**) containing the information relating to the various connexions to be carried out depending on the connexion elements (**2**) provided at the end of each cable (**3**), and on the housings (**4A**) of said connectors (**4**), as well as the types of insertion members (**8**) to be selected as a function of the connexion elements to be connected, and to which unit are joined up the means (**22**) for controlling the means (**20**) for grasping each selected member, and the displacements of each body (**7**) along the OX, OY and OZ aces of said reference system.

5,485,661
ENVIRONMENTALLY-PROTECTIVE COMBINATION BURIAL/SHIPPING/CREMATION CASE

Wilbur F. McClure, 973 Meadow La., Troy, Ohio 45373

Filed Jul. 9, 1993, Ser. No. 88,726
Int. Cl.[6] A61G *21/00*
U.S. Cl. 27—7 **13 Claims**



1. In a corpse-containing utility case, a generally-rectangular lower section comprising an elongated horizontal bottom barrier, a pair of opposed side barriers extending vertically upward from opposite side edges of said bottom barrier and a pair of opposed end barriers extending vertically upward from opposite end edges of said bottom barrier; all of said sid barriers and end barriers being essentially of the same height and forming a horizontal upper edge around said lower section of said case; and a generally-rectangular lid for enclosing and sealing the upper edge of said lower section; the improvement comprising:

said lower section having a unitary liquid-impervious outer jacket and a unitary air-pervious shell located inwardly of said outer jacket and providing a space between said shell and said jacket, said shell and said outer jacket being joined around the upper edges of said side barriers and said end barriers to thereby form an integral double-walled lower section of said case.

5,485,662
APPARATUS AND METHOD FOR CRIMPING FIBER FOR NONWOVEN APPLICATIONS

Ray W. Hodges, Jr., and Shiv Sibal, both of Conyers, Ga., assignors to Hercules Incorporated, Wilmington, Del.

Filed Apr. 29, 1994, Ser. No. 235,306
Int. Cl.[6] D02G *1/12*
U.S. Cl. 28—263 **62 Claims**

1. A crimper for crimping fiber, comprising:

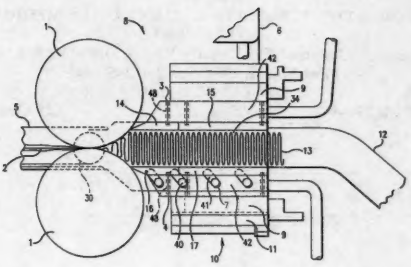
a stuffer box comprising:

a first doctor blade;

a second doctor blade opposing said first doctor blade; and forming a crimping zone with said first doctor blade

means for feeding fiber into said stuffer box; positioned upstream of said crimping space and

means for directly cooling the stuffer box so as to indirectly cool fiber passing through said stuffer box.



5,485,663

METHOD OF FABRICATING AN INK JET PRINT HEAD

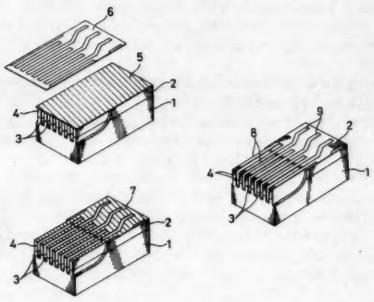
Kuniaki Ochiai, and Shigeo Komakine, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Tec, Shizuoka, Japan

Division of Ser. No. 853,267, Mar. 18, 1992, Pat. No. 5,311,218. This application Jan. 26, 1994, Ser. No. 186,634

Claims priority, application Japan, Mar. 19, 1991, 3-54296; Jan. 2, 1991, 3-255563

Int. Cl.[6] H01L *41/22*; B41J *2/01*

U.S. Cl. 29—25.35 4 Claims



1. A method of fabricating an ink jet print head, comprising steps of:

joining together a piezoelectric plate formed of a piezoelectric material and polarized in a direction of its thickness and a base plate formed of a nonconductive, nonelectrostrictive material having a rigidity lower than a rigidity of the piezoelectric material forming the piezoelectric plate;

forming a plurality of parallel grooves through the piezoelectric plate into the base plate by grinding so that an internal structure of the base plate is exposed in the ground surfaces of side walls between the grooves;

forming metal layers over entire bottom surfaces of the grooves and entire side surfaces of the side walls by electroless plating to form electrodes;

joining a top plate to an upper surface of the piezoelectric plate so as to close the grooves to form pressure chambers; and

attaching a nozzle plate provided with a plurality of ink jets corresponding respectively to the pressure chambers to one end of the assembly of the base plate, the piezoelectric plate and the top plate.

5,485,664

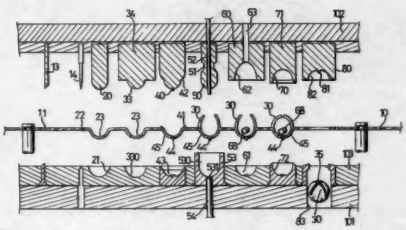
METHOD FOR PRODUCING GLOBE-SHAPED BELLS WITH SINGLE PIECE SHELLS

Chung-Shyan Huang, No. 1-1, Chang Mar Street, Hsiu Shui Hsiang, Chang Hua Hsien, Taiwan, Prov. of China

Filed Mar. 10, 1995, Ser. No. 402,462

Int. Cl.[6] B29D *17/00*

U.S. Cl. 29—169.5 3 Claims



1. A method for manufacturing a bell including a first half having an eye formed therein and a second half having four blades formed therein and having a cross shaped groove formed therein, said method comprising:

preparing a mold assembly comprising a lower mold including a plurality of first mold cavities formed therein for engaging with said first half of said bells, and comprising a plurality of mold pieces movable downward toward said lower mold, and

feeding a plate member step by step through said mold assembly,

wherein the first of said mold pieces are provided to form three slits in said plate member so as to define a unit in said plate member, a pair of second of said mold pieces are provided for forming a pair of positioning holes in said plate member, a third of said mold pieces is provided for forming a recess in said unit, a fourth of said mold pieces is provided for forming said blades, said blades are coupled to said plate member by at least one coupling portion, a fifth of said mold pieces is provided for forming said eye in said first half of said bell, a sixth of said mold pieces is provided for bending said blades, a seventh of said mold pieces includes an aperture formed therein for supplying a sounder into said first half of said bell, an eighth of said mold pieces includes a second mold cavity formed therein for bending said blades so as to form said second half of said bell, and a ninth of said mold pieces is provided for cutting said coupling portion so as to disengage said bell from said plate member.

5,485,665

GASKET SIZE CONTROL

Kevin T. Marks, Crick; Nigel D. Salter, Wellesbourne; Rosario Remedios, and Peter Waddington, both of Rugby, all of, United Kingdom, assignors to T&N Technology Limited, Rugby, England

PCT No. PCT/GB92/01217, § 371 Date Jan. 21, 1994, § 102(e) Date Jan. 21, 1994, PCT Pub. No. WO93/02303, PCT Pub. Date Feb. 4, 1993

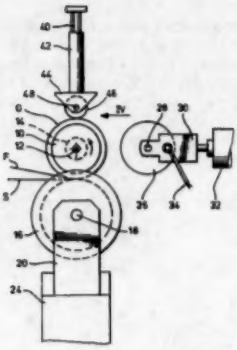
PCT Filed Jul. 17, 1992, Ser. No. 185,842

Claims priority, application United Kingdom, Jul. 23, 1991, 9115862

Int. Cl.[6] F16J *15/12*; B21C *47/06*

U.S. Cl. 29—407 15 Claims

1. A method of controlling the size of spiral gaskets which are formed by winding a sealing grip and a compressible filler strip around a mandrel so that the filler strip is interposed between turns of the sealing strip, characterised in that the method comprises continuously monitoring the size of the gasket as it is formed by measuring the angle through which the mandrel turns and the length of arcs on the periphery of the gasket as is it is wound, the



arcs being defined by the angles through which the mandrel turns, and terminating the supply of strip as a result of an arc achieving a particular length.

5,485,666

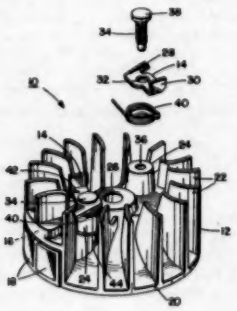
ROTOR ASSEMBLY APPARATUS AND METHOD

Lynn C. Welborn, King Mountain; Parks W. Stiles, and José I. Venegas, both of Gastonia, all of N.C., assignors to Homelite Inc., Charlotte, N.C.

Filed Nov. 9, 1993, Ser. No. 149,476

Int. Cl.[6] B23P *11/00;19/00*

U.S. Cl. 29—436 **30 Claims**



24. A method of operably connecting a first end of a spring to a starter pawl on a rotor assembly comprising steps of:

extending, by a positioner, an elongate member between cooling fins of a rotor of the assembly;

hooking the first end of the spring with a hook on a distal end of the elongate member;

retracting, by the positioner, the elongate member to thereby move the first end of the spring;

moving the distal end of the elongate member upward to thereby move the first end of the spring upward; and

axially rotating the elongate member to allow the hook on the distal end to disengage from the first end of the spring.

5,485,667

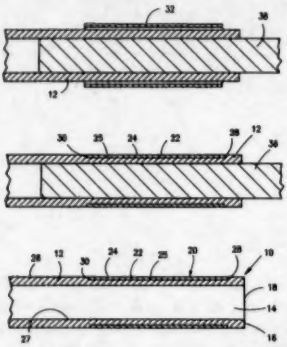
METHOD FOR ATTACHING A MARKER TO A MEDICAL INSTRUMENT

Stephen J. Kleshinski, 599 Country Way, Scituate, Mass. 02066

Filed Mar. 3, 1994, Ser. No. 205,106

Int. Cl.[6] B23P *11/02*

U.S. Cl. 29—447 **21 Claims**



18. A method for attaching a marker to a medical instrument comprising the steps of:

providing a medical instrument having an outer surface and an inner chamber defined by an inner surface, at least one of said inner and outer surfaces being formed of a thermally responsive material which is softened at a softening temperature;

providing a marker formed of a shape-memory material capable of having a deformed configuration while at a first temperature and an original configuration at a second higher temperature;

lowering the temperature of said marker to said first temperature and deforming said marker;

positioning said marker in the deformed configuration adjacent to said inner or outer surface of thermally responsive material for subsequent engagement therewith; and

raising the temperature or said shape-memory material to said second temperature and said softening temperature to soften said thermally responsive material while causing said shape-memory material to transform from said deformed configuration to said original configuration wherein said marker engages said medical instrument.

5,485,668

NEEDLE AND SUTURE SWAGING METHOD

David Demarest, Parsippany; Robert B. Duncan, Bridgewater, both of N.J., and William Rattan, Cerritos, Calif., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 181,599, Jan. 13, 1994. This application Mar. 9, 1995, Ser. No. 401,365

Int. Cl.[6] B21D *39/00*

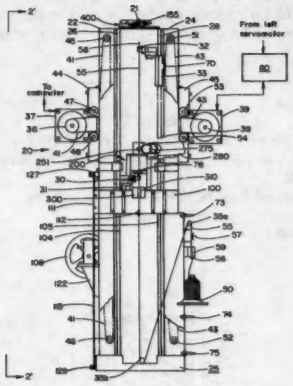
U.S. Cl. 29—517 **4 Claims**

1. A method for automatically threading and swaging a suture strand to a suture receiving opening formed in a surgical needle, said method comprising the steps of:

(a) gripping said suture strand at a free end thereof under tension from an indefinite length supply of suture material, said gripping accomplished by a first gripper means reciprocable along a suture axis from a cutting zone to an insertion zone;

(b) advancing said first gripper means and said suture strand gripped thereby along said suture axis from said cutting zone to said insertion zone;

(c) positioning said needle in a swage die opening formed between first and second swaging dies with said suture receiving opening thereof aligned with said suture axis;



(d) further advancing said first gripper means along said suture axis to direct said free end of said suture strand through an alignment guide positioned in the insertion zone between said free end of said suture strand and said suture receiving opening of said needle, whereby said free end of said suture strand is inserted into said suture receiving opening of said needle;

(e) gripping said suture strand at or slightly below said cutting zone, said gripping accomplished by a second gripper means reciprocable along a suture axis from a cutting zone to an insertion zone;

(f) advancing at least one of said first and second swaging dies to swage said surgical needle about the suture strand to form a needle-suture assembly; and

(g) cutting said suture strand at said cutting zone to obtain a needle-suture assembly gripped by said first gripper means and a suture strand of indefinite length gripped by said second gripper means.

5,485,669

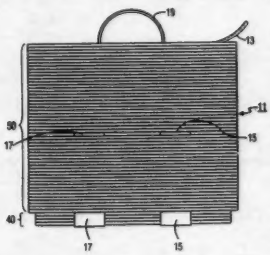
METHOD OF MAKING AN ELECTRICAL COIL

Joseph S. Droho, Chicago, Ill., assignor to Philips Electronics North America Corporation, New York, N.Y.

Division of Ser. No. 226,183, Apr. 11, 1994. This application Apr. 20, 1995, Ser. No. 426,295

Int. Cl.[6] H01F *41/10*

U.S. Cl. 29—605 **8 Claims**



1. A method for winding a precision wound coil having at least a tapped layer with at least one tapped turn, an adjacent layer and a previous layer, comprising the steps of:

winding of turns to form the previous layer and a partially wound adjacent layer;

positioning a first anchor and a second anchor so that each anchor is in contact with both the partially wound adjacent layer and the previous layer;

winding of turns to form a fully wound adjacent layer whereby a first portion of each anchor is secured between the adjacent layer and the previous layer;

winding of turns to form a partially wound tapped layer including a portion of the at least one tapped turn;

temporarily lifting the first anchor from contact with the adjacent layer until the at least one tapped turn has been wound under the first anchor;

repositioning the first anchor to once again be in contact with the adjacent layer;

forming a loop from the at least one tapped turn between the first anchor and the second anchor;

temporarily lifting the second anchor from contact with the adjacent layer until the at least one tapped turn has been wound under the second anchor;

repositioning the second anchor to once again be in contact with the adjacent layer; and

winding of turns to form a fully wound tapped layer whereby a second portion of each anchor is secured between the tapped layer and the adjacent layer;

wherein in winding each layer grooves are formed between adjacent turns and wherein turns of the adjacent layer nest into the grooves of the previous layer and turns of the tapped layer nest into the grooves of the adjacent layer.

5,485,670

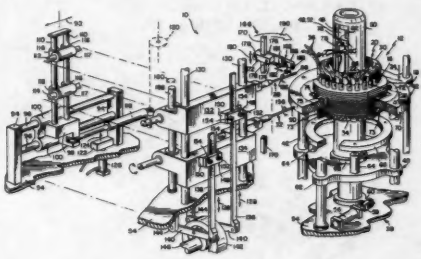
STATOR COIL LACING MACHINE

David G. Bouman, Ossian, Ind.; Larry D. Moser, Ohio City, Ohio, and Keith W. Moser, Fort Wayne, Ind., assignors to Alliance Winding Equipment, Inc., Fort Wayne, Ind.

Filed Aug. 30, 1993, Ser. No. 114,216

Int. Cl.[6] H02K *15/02*

U.S. Cl. 29—732 **42 Claims**



1. A stator coil lacing machine, comprising:

means for orienting a stator on the stator coil lacing machine, the orienting means including an arbor on which the stator is placed;

means for stitching lacing cord around stator coils of the stator;

a cord clamp disposed within the arbor for securing the lacing cord;

cord handling means for receiving a continuous length of cord and delivering the cord to the stitching means, the cord handling means being disposed within the arbor; and

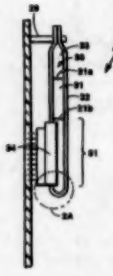
means for adjusting the relative positioning of the stitching means, the cord clamp, and the cord handling means without disassembly of the stator coil lacing machine so that the machine accommodates a range of stator stack heights.

5,485,671

METHOD OF MAKING A TWO-PHASE THERMAL BAG COMPONENT COOLER

Ralph I. Larson, Bolton, Mass., and Richard L. Phillips, Alachua, Fla., assignors to Aavid Laboratories, Inc., S. Lancaster, Mass.

Continuation-in-part of Ser. No. 120,153, Sep. 10, 1993. This application Mar. 22, 1994, Ser. No. 215,541
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—840.032 7 Claims



1. A method for fabricating a cooling apparatus comprising a closed bag having at least one wall of flexible, thermoplastic sheet material with a hole therein, the hole having a periphery, and an aluminum plate having a surface, the method comprising the steps of:

A. anodizing without sealing the aluminum plate surface to produce a porous anodized plate surface; and

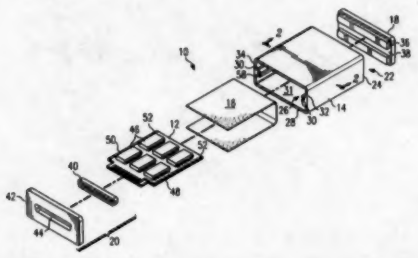
B. adhering the sheet material at the hole periphery to the porous anodized plate surface to produce a sealed bag.

5,485,672

METHOD FOR ENCASING A PRINTED WIRING BOARD

Alton D. Carpenter, Houston, and Howard W. Segler, Stafford, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 21, 1993, Ser. No. 81,494
Int. Cl.[6] H05K *3/30*
U.S. Cl. 29—841 6 Claims



1. A method for encasing a printed wiring board comprising the steps of:

covering the printed wiring board with an adhesive material;

extruding a housing having an internal surface, first and second ends, first and second sides, and first and second openings at the first and second ends thereof from a plastic material reinforced with electrically conductive fiber;

cutting the housing to an appropriate length for the printed wiring board;

inserting the covered printed wiring board into the second opening of the housing such that the printed wiring board is held in place by internal ribs disposed on the internal surface of the housing; and

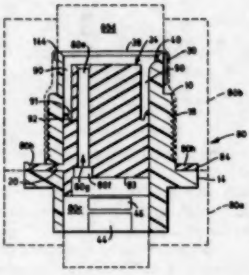
inserting an end plug into the first opening and a coupling member into the second opening of the housing such that the printed wiring board is held in place within the housing.

5,485,673

ENVIRONMENTAL CONNECTOR

Frederick L. Lau, Skokie, Ill., assignor to Switchcraft Inc., Chicago, Ill.

Filed Jun. 16, 1994, Ser. No. 260,595
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—883 9 Claims



1. A method of making an electrical connector, comprising the steps of:

forming a plastic housing having an axis and being formed with an axial chamber extending between opposing open ends, said housing having an external annular shoulder and an aperture adjacent to said shoulder;

positioning said housing in a cavity of an insertion mold having at least one post extending axially through said chamber of said housing, said cavity having an annular void adjacent to said shoulder;

injecting thermoplastic rubber into said chamber of said housing to form a rubber insert of predetermined shape within said housing and around said at least said one post, and to cause said thermoplastic rubber to flow out of said aperture and around said housing in said annular void to form an annular ring against said shoulder wherein said insert and said ring are interconnected as one piece;

removing said housing and insert from said cavity and away from said at least one post to form at least one axial bore through said insert within said chamber in the space vacated by said at least one post; and

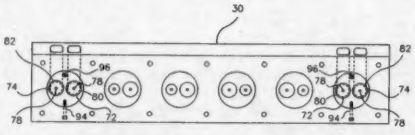
inserting at least one conductive contact into said bore.

5,485,674

METHOD OF CONSTRUCTING AN APPARATUS FOR COMPRESSING GAS

Lynn Caldwell, Rt. 2, Box 159-1, Wetumka, Okla. 74883

Division of Ser. No. 173,988, Dec. 28, 1993, Pat. No. 5,378,113. This application Sep. 23, 1994, Ser. No. 311,610
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—888.011 20 Claims



1. A method of constructing an apparatus for compressing gas, said method comprising the steps of:

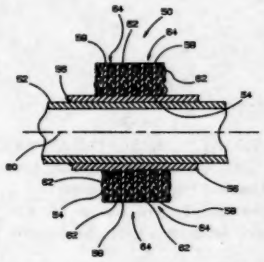
providing an internal combustion engine;
modifying an engine piston into a compressor piston;
removing valves from the internal combustion engine;
providing an intake compressor valve;
installing an intake compressor valve securing means for securing the intake compressor valve in the apparatus;
providing a discharge compressor valve; and
installing a discharge compressor valve securing means for securing the discharge compressor valve in the apparatus.

5,485,675

PROCESS FOR PRODUCING AN ACTIVATED CARBON ADSORBENT WITH INTEGRAL HEAT TRANSFER APPARATUS

Jack A. Jones, Los Angeles, and Andre H. Yavrouian, Glendale, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 955,465, Oct. 2, 1992. This application Oct. 20, 1994, Ser. No. 325,138
Int. Cl.[6] B23P *15/26*
U.S. Cl. 29—890.046 **19 Claims**



1. A process for producing an integral adsorbent-heat exchanger apparatus for the transfer of heat and sorbate comprising:
a. wetting activated carbon particles with a mixture which comprises a binder having a carbon based molecular structure and a solvent for the binder thereby forming a particle mixture;
b. adjusting the solvent content of the particle mixture so that it is operable for pressing onto a surface without exuding a large amount of solvent thereby producing an adjusted mixture;
c. pressing the adjusted mixture onto the surface of a metal tube;
d. thereafter, removing an effective amount of solvent from the adjusted mixture pressed onto the tube operable for allowing the adjusted mixture to be pyrolyzed to a density of at least about 0.3 g/cc while remaining on the tube thereby forming an intermediate mixture; and
e. thereafter, subjecting the tube with the intermediate mixture thereon to an elevated temperature operable for pyrolyzing the binder, for bonding the activated carbon particles to each other to form a bonded activated carbon matrix, and for adjoining the matrix to the tube thereby producing an integral adsorbent-heat exchanger apparatus for the transfer of heat and sorbate.

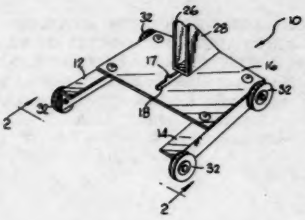
5,485,676

CARPET CUTTING KNIFE GUIDE

Mark A. Terhorst, 637 Newton St., Denver, Colo. 80204

Filed Aug. 9, 1994, Ser. No. 287,930
Int. Cl.[6] B26B *29/06*
U.S. Cl. 30—294 **11 Claims**

1. A carpet cutting knife guide for cutting overlapping adjacent edges of two pieces of carpet to be laid adjacently on a floor, the guide comprising:
a) a first lateral member and a second lateral member substantially parallel to each other and spaced from each other;



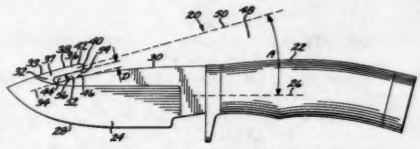
b) a platform member extending from the first lateral member to the second lateral member and attached to the first and second lateral members, the platform member being substantially parallel with the floor and having an opening through which at least a blade of a carpet cutting knife member having a proximal handle and a distal blade can pass, with said opening having in conjunction therewith at least one friction fit means whereby a portion of the knife member can be releasably retained, with said platform member constructed of a flexible material such that exerting a force on the handle of the releasably retained knife member or on the platform member causes the knife member to limitedly move substantially perpendicularly toward the floor when said force is exerted; and
c) movement means extending substantially perpendicularly from and attached to each of the lateral members for manually moving the guide over the overlapping edges of the carpet to be cut.

5,485,677

KNIFE WITH FABRIC CUTTER

Brett P. Seber, Escondido, Calif., assignor to Buck Knives, Inc., El Cajon, Calif.

Continuation-in-part of Ser. No. 929,731, Aug. 13, 1992, Pat. No. 5,359,778. This application Sep. 16, 1994, Ser. No. 307,182
Int. Cl.[6] B26B *29/00*
U.S. Cl. 30—294 **20 Claims**



1. A knife, comprising:
a handle;
a blade joined to the handle and having a blade back; and
a fabric cutter integral with the blade and including
a fabric cutter body extending laterally outwardly from the blade back of the blade, an outwardly extending margin of the fabric cutter body defining a fabric cutter back,
a finger with no sharp edges, the finger extending rearwardly toward the handle from the outward margin of the fabric cutter body, the finger having a length of about 0.3 inches, the finger having a finger back forming a continuous surface with the fabric cutter back, the fabric cutter back and finger back being oriented at an angle to the handle of about 13.5 degrees,
the fabric cutter body, the finger, and a portion of the blade back defining a fabric cutter slot having a slot outer side and separated from the slot outer side by a distance of about 0.125 inches, and a slot bottom,
an outer ramp from the slot outer side to the slot bottom, the outer ramp having a radius of about 0.090 inches,
an inner ramp from the slot inner side to the slot bottom, the inner ramp having a radius of about 0.090 inches, and
a sharpened cutting edge at the slot bottom.

5,485,678

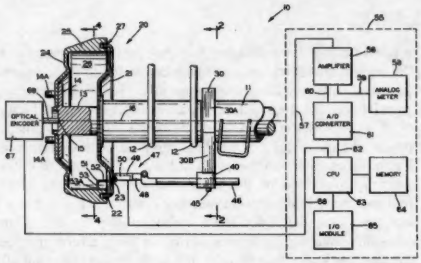
APPARATUS AND METHOD FOR MEASURING THE CIRCULARITY AND ECCENTRICITY OF A BRAKE DRUM WHILE MOUNTED UPON A VEHICLE

Theadore J. Wagg, New Hudson; James K. Clark, Canton, and Robert S. Sporzynski, Chelsea, all of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Aug. 15, 1994, Ser. No. 290,333

Int. Cl.[6] G01D *21/00*

U.S. Cl. 33—610 **24 Claims**



1. An apparatus for measuring the circularity of a brake drum, the drum being mounted upon a vehicle and rotatable about an axis of rotation, the apparatus comprising:

means adapted for mounting on a stationary portion of the vehicle for sensing a variation of a distance extending from the axis of rotation to a braking surface formed on an inner surface of the brake drum, said variation sensing means generating a first signal proportional to said variation;

means for sensing an angular position of the brake drum, said angular position sensing means generating a second signal indicative of the angular position of the drum; and

processing means connected to said variation sensing means and said angular position sensing means for receiving and operatively combining said first and second signals to define a data point.

5,485,679

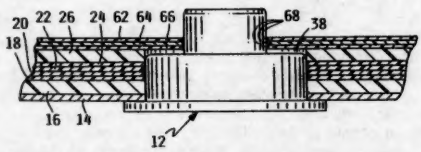
IMAGE REGISTRATION BOARD AND COMPRESSIBLE PIN ASSEMBLY

Gretchen Ternes, Shoreview, Minn., assignor to Ternes-Burton Company

Filed Oct. 18, 1991, Ser. No. 780,739

Int. Cl.[6] G01D *21/00*

U.S. Cl. 33—623 **47 Claims**



1. An image board and compressible pin assembly for use in maintaining the registration of a flat or a plate during layout, stripping, transfer, or in a platemaker, said flat or said plate having at least one registration hole associated therewith, said platemaker having a cover movable into close parallel contact with said flat or said plate, said image board and compressible pin assembly comprising:

an image board having at least one base layer, at least one filler layer connected to and disposed above said base layer, at least one intermediate layer connected to and disposed above said at least one filler layer, and a bed layer connected to and disposed above said at least one intermediate layer, said at least one base layer having a bottom surface and said bed layer having a top surface, said image board defining an aperture extending entirely through each of said at least one base layer, said at least one filler layer, said at least one intermediate layer, and said bed layer, said image board defining a top side adjacent said top surface of said bed layer and a reverse side adjacent said bottom surface of said at least one base layer; and

a compressible registration pin having a body and a post mounted for reciprocal movement relative to said body, said body being selectively and removably mountable within said aperture from said reverse side of said image board, said body including a flange member projecting therefrom, said flange member contacting said bottom surface of said base layer when said body is completely mounted within said aperture, at least a portion of said post initially extending above said top surface of said bed layer such that the flat or the plate may be placed thereon with the registration hole thereof receiving said portion of said post extending above said top surface of said bed layer therein when said post is in an extended position, said post being movable to a retracted position in response to contact between the cover of the platemaker and said post.

5,485,680

ENCAPSULATED MEASURING APPARATUS

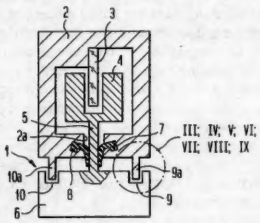
Günther Nelle, Bergen, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Jun. 15, 1994, Ser. No. 259,925

Claims priority, application Germany, Jul. 15, 1993, 43 23 635.9

Int. Cl.[6] G01B *11/02*

U.S. Cl. 33—705 **8 Claims**



1. An encapsulated measuring apparatus for determining a relative position of two objects, comprising:

a housing;

an installation pedestal for supporting said housing;

scale means located in said housing;

means located in said housing for probing said scale;

first seal means for sealing said housing;

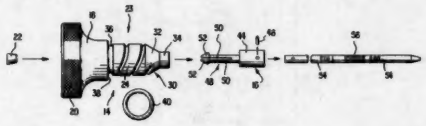
an entrainment member extending through said first seal means for connecting said probing means with an object to be measured, said entrainment member being connected with said installation pedestal; and

at least one additional seal means provided between said installation pedestal and said housing for additionally sealing said housing from harmful effects, said at least one additional seal means being provided in a region remote from a location in which said entrainment member extends between said housing and said installation pedestal.

5,485,681
SWIVEL TYPE DIPSTIK

Robert S. Hitchcock, Lake Providence, La., assignor to Moeller Products, Inc., Greenville, Mich.

Filed Jun. 28, 1994, Ser. No. 266,668
Int. Cl.[6] G01F *23/04*
U.S. Cl. 33—722 **5 Claims**

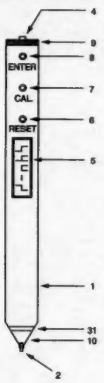


1. A dipstick for use with a fill tube, said dipstick comprising:
a screw-on cap;
a blade dependent from said cap;
swivel means interposed between said blade and said cap for allowing said blade to rotate freely about its longitudinal access, said swivel means further comprising engaging means for slidingly engaging a surface; and receiving means for receiving said engaging means and wherein said receiving means comprises a segment of said cap having a conical interior.

5,485,682
OPTO-MECHANICAL INSTRUMENT TO ACCURATELY MEASURE LINEAR DISTANCES ON FLAT OR CURVED SURFACES

Guy C. Le Baeton, 1008 N. Oak Park Ave., Oak Park, Ill. 60302

Filed Dec. 7, 1994, Ser. No. 350,888
Int. Cl.[6] G01B *3/12*
U.S. Cl. 33—773 **20 Claims**

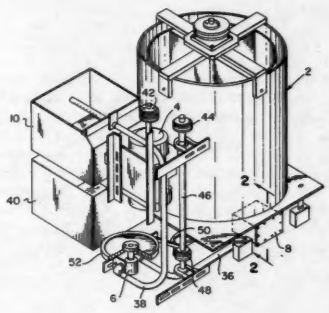


1. A tracking device for determining a scalable distance over a surface, the device comprising:
a rotary element adapted to frictionally contact the surface;
a sensor for generating pulses in proportion to a rotation of the rotary element;
counting means for storing a count of pulses in a first register;
first enter means for downloading the count from the first register to a third register;
dividing means for dividing a second register by a third register to yield a numerical ratio;
second enter means for downloading the ratio to a fourth register;
multiplying means for multiplying the count by the fourth register to yield a numerical product;
calibrate means for downloading the product to the second register;
display means for displaying the product;
first reset means for setting the first register to zero;
second reset means for setting the first register to zero, setting the second register to one, and setting the third register to one; and
initializing means for setting the fourth register to one;
whereby to scale a distance on a surface
the fourth register may be set to one with initializing means,
the rotary element may be turned to input into the first register a track number,
the multiplying means may yield the numerical product equal to the track number,
the track number may be downloaded into the second register with the calibrate means,
the rotary element may be run over a scale illustration corresponding to the distance scale number to input into the first register a scale number,
the first enter means may download the scale number into the third register,
the dividing means may yield the numerical ratio equal to the track number over the scale number,
the second enter means may download the ratio to a fourth register,
the rotary element may be run over an arbitrary line on the surface,
the multiplying means may yield the numerical product equal to the count times the ratio, and
the display means may display the numerical product, the numerical product being a scaled distance over the surface corresponding to the arbitrary line.

5,485,683
CENTRIFUSE EXTRACTOR

Glenn D. Morgan, Powhatan, Va., assignor to Charles M. Neal, Richmond, Va.

Filed Mar. 8, 1994, Ser. No. 207,213
Int. Cl.[6] B26B *17/30;17/24*
U.S. Cl. 34—58 **4 Claims**



4. A mobile centrifuge extractor for removing fluids from mats and pads, comprising
(a) a cart;
(b) a fixed cylindrical housing mounted on said cart and defining a centrifuge chamber, said housing having a vertical axis and a lower fluid outlet and being open at its upper end;
(c) a cylindrical screen concentrically arranged in spaced relation within said housing to define inner and outer housing chambers, said screen being rotatably connected with said housing and having an open upper end;
(d) a plurality of radially arranged divider walls connected with said screen within said inner chamber for dividing said inner chamber into a plurality of compartments;
(e) an axial shaft connecting said divider walls;
(f) bearing means connected with said housing for supporting said axial shaft for rotation relative to said housing;

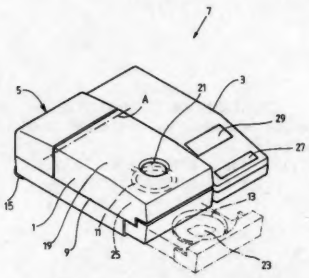
(g) first filter means connected with said housing lower fluid outlet for removing coarse particulates from the fluid;
(h) a pump connected with said first filter means for drawing fluid from said housing through said first filter means;
(i) drive means connected with said cart for rotating said cylindrical screen and driving said pump;
(j) second filter means connected with an outlet of said pump for removing fine particulates from the fluid; and
(k) means arranged beneath said second filter means for collecting filtered fluid, whereby when fluid soaked mats or pads are loaded into said compartments and said screen is rotated, fluid is extracted from the mats and pads by centrifugal force, drawn from said housing lower fluid outlet through said first filter means, pumped through said second filter means, and collected in said collecting means.

5,485,684

DRYER WITH PRECISION BALANCE

Florian Philipp, Bertschikon; Alfred Hautle; Reto Nuesch, both of Greifensee, and Beat Straub, Uster, all of, Switzerland, assignors to Mettler-Toledo AG, Greifensee, Switzerland

Filed Dec. 8, 1993, Ser. No. 163,925
Claims priority, application Switzerland, Feb. 16, 1993, 00472/93
Int. Cl.[6] F26B *19/00*
U.S. Cl. 34—226 **13 Claims**



1. A drying apparatus with a built-in precision balance for determining the moisture content of material to be weighed, the apparatus comprising a housing, a weighing dish for receiving the material, the balance having a measuring cell, a load-receiving means being connected to the measuring cell, a heat source being mounted above the weighing dish for heating the material, the weighing dish being located within the housing during drying, and means for moving the weighing dish in an essentially horizontal plane into and out of the housing for making the weighing dish accessible for charging and weighing-in of the material.

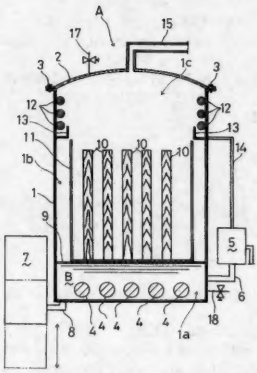
5,485,685

WOOD TREATING METHOD

Yotaro Hashimoto, Shiga, Japan, assignor to Eiwa Co., Ltd., Shiga, Japan

Continuation of Ser. No. 33,155, Mar. 16, 1993, abandoned. This application Oct. 24, 1994, Ser. No. 328,383
Claims priority, application Japan, Apr. 10, 1992, 4-089198; Dec. 22, 1992, 4-342513
Int. Cl.[6] F26B *3/00*
U.S. Cl. 34—348 **4 Claims**

1. A wood treating method, comprising the following steps of:
providing a mixture of methylene chloride solvent and water in a container, said water accounting for approximately 90% of said mixture;
heating said mixture in said container at approximately 100° C.–140° C. so that vapors of said methylene chloride solvent and said water are simultaneously generated;



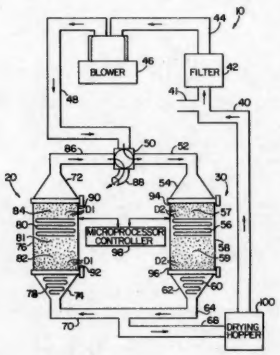
confining wood to be treated and said vapor of said mixture in a pressure container which is hermetically sealed with respect to an outer atmosphere so that said wood contacts solely with said vapor of said mixture;
permeating said vapor of said mixture into cells of said wood;
melting oil and fat contents in cell membranes of said cells by said vapor thereby creating perforations in said cell membranes; and
removing excess water confined in said cells of said wood through said perforations in said cell membranes.

5,485,686

HI-PERFORMANCE DESICCANT TOWER

Charles F. Sears, Jr., Tolland, Conn., assignor to Dri-Air Industries, Inc., East Windsor, Conn.

Filed May 25, 1994, Ser. No. 248,739
Int. Cl.[6] F26B *21/06*
U.S. Cl. 34—473 **19 Claims**



1. A system of drying and heating process air to be circulated for drying hygroscopic thermoplastic material contained in a drying hopper before the material is introduced into a plastic processing machine, the system including:
a drying hopper for containing hygroscopic thermoplastic material before the thermoplastic material is introduced into a plastics processing machine;
process air for drying said hygroscopic thermoplastic material contained in said drying hopper;
first and second desiccant towers, each of said towers alternating between a process cycle and a regeneration cycle while the other tower is in an opposite cycle;

desiccant contained in said first and second desiccant towers for adsorbing moisture from the process air;

regeneration air for driving moisture off saturated desiccant in one of said towers in a regeneration cycle;

air conduit means providing a path for circulating the process air between the drying hopper and the first and second desiccant towers;

air circulating means for circulating the process air through the air conduit means;

air flow directing means for directing the process air to the top end of one of said desiccant towers thereby placing said one of the towers in a process cycle while the other of the towers is placed in a regeneration cycle, said air flow directing means also directing the regeneration air exiting from a top end of said other of the towers in a regeneration cycle to a vent;

means for regulating the time period and temperature of the process and regeneration cycles;

first and second bottom heater means respectively housed adjacent to a bottom end of the first and second desiccant heating towers and extending in a plane traverse to the longitudinal direction of the respective desiccant heating towers to heat the desiccant so as to adsorb moisture from said process air circulating downwardly through one of said towers in a process cycle, and for simultaneously super-heating and driving moisture off the desiccant by means of said regeneration air circulating upwardly through the other of said towers in a regeneration cycle, said regeneration air carrying by means of convection a generally bottom-originating hot convection wave front propagating upwardly through the desiccant in said tower in a regeneration cycle; and

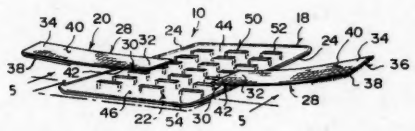
first and second generally central heater means respectively housed between top and bottom ends of said first and second desiccant towers and extending in a plane transverse to the longitudinal direction of the respective desiccant heating towers for super-heating and driving moisture off the desiccant by means of said regeneration air carrying a generally centrally-originating hot convection wave front propagating upwardly through the desiccant of one of said towers in a regeneration cycle, the generally centrally-originating hot convection wave front coupled with the bottom-originating hot convection wave front considerably reducing the time to completely regenerate the saturated desiccant in said one of said towers in a regeneration cycle.

5,485,687

ANTI-SLIP SHOE ATTACHMENT DEVICE

Gilbert Rohde, Box 97, New Town, N. Dak. 58763

Filed Mar. 28, 1994, Ser. No. 218,431
Int. Cl.[6] A43C *15/00*
U.S. Cl. 36—62 **1 Claim**



1. An anti-slip attachment device for and in combination with a shoe having a sole with a flat bottom and a vamp, which comprises:

a) a plate fabricated out of a rubberized canvas material fitted against the flat bottom of the sole of the shoe, said plate being sized to extend across the width of the sole of the shoe, so that each side of said plate can be properly aligned with each edge of the sole;

b) means for mounting said plate in a removable manner against the bottom of the sole of the shoe, said mounting means comprising a pair of straps of elastic webbing material, said means including adhesive material for attaching a first end of each said strap adjacent to one side of said plate, so that said straps are opposite from each other and can extend over the vamp of the shoe, with their second ends overlapping, and means including a mating hook and loop pile fastener on the overlapping second ends of said straps for connecting the two straps together, so that said plate when mounted will be in a stationary position with respect to the sole; and

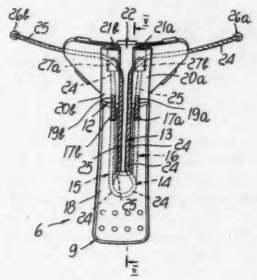
c) means on the bottom of said plate for preventing the sole of the shoe from slipping on an icy surface comprising a plurality of staples, each having a crown and a pair of pointed legs, in which each said staple is inserted through said plate, so that the crown sits on the top of said plate and in contact with said flat bottom of said sole, while the pointed legs protrude through the bottom of said plate.

5,485,688

LEVER, PARTICULARLY FOR SKI BOOTS

Roberto Gorza, Feltre; Luca Gallina, Caerano San Marco, and Pino Tessari, Riese Pio X, all of, Japan, assignors to Nordica S.p.A., Trevignano, Italy

Filed Nov. 29, 1993, Ser. No. 158,534
Claims priority, application Italy, May 18, 1993, TV93A0054
Int. Cl.[6] A43B *5/04*
U.S. Cl. 36—117 **18 Claims**



1. In combination, a lever (**5**) and a ski boot (**1**), said ski boot (**1, 2, 3**) comprising a shell (**2**), at least one quarter (**3**) connected to said shell (**2**), and an upper perimetric edge (**8**) defined by said quarter (**3**), said lever (**5**) comprising;

a support (**7**) connected to said quarter (**3**) at a portion thereof adjacent to said upper perimetric edge (**8**);

at least two traction elements (**24,25**) each having one end connected to said ski boot (**2, 3**) and another end (**27***a*, **27***b*) connected to said support (**7**);

a lever arm (**6**) having a base (**11**), and an upper surface (**18**) located opposite said base (**11**), said lever arm (**6**) being connected to said at least two traction elements (**24, 25**);

a first end (**9**) defined by said lever arm (**6**), said first end (**9**) being movable with respect to said support (**7**);

a second end (**10**) defined by said lever arm (**6**) opposite said first end thereof;

a third end (**12**) defined by said support (**7**) and shaped complementarily with respect to said second end (**10**), said second end (**10**) being arranged adjacent to said third end (**12**);

a first seat (**13**), a second seat (**14**), a third seat (**15**) and a fourth seat (**16**) defined in said lever arm (**6**) for accommodating said at least two traction elements (**24,25**), said first seat (**13**) formed axially with respect to said lever arm (**6**) and extending thereon from said second end (**10**), said second seat consisting of an annular seat (**14**) defined on said lever arm (**6**) for guiding said traction elements (**24, 5**) and connected to said first seat (**13**) at a location proximate to said first end (**9**), said third seat (**15**) and said fourth seat (**16**) being formed laterally with respect to said first seat (**13**) within said lever arm (**6**) and connected to said second seat (**14**);

a pair of first openings (**17***a*, **17***b*) connecting said third seat (**15**) and said fourth seat (**16**) to said upper surface (**18**) of said lever arm (**6**);

a pair of longitudinal protrusions (**20***a*, **20***b*) protruding above said support (**7**) on said upper surface (**18**) of said lever arm (**6**), and;

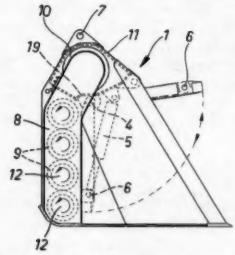
a pair of second openings (**19***a*, **19***b*) formed in said pair of longitudinal protrusions (**20***a*, **20***b*) coaxially with respect to said first openings (**17***a*, **17***b*).

5,485,689

BUCKET CRUSHER

Markku Jonninen, Hollola, Finland, assignor to Ideachip Oy, Hollola, Finland

Filed Jun. 17, 1994, Ser. No. 261,410
Claims priority, application Finland, Jun. 17, 1993, 932791
Int. Cl.[6] E02F *3/92*
U.S. Cl. 37—189 **8 Claims**



1. A bucket crusher to be mounted in place of the bucket of an excavator for crushing material, comprising:

substantially horizontal shafts having crushing tools which, as the shafts are rotating, disintegrate the material to be crushed and deliver resulting crushed aggregate between the shafts;

wherein said shafts as well as their crushing tools have a same rotating direction when in an operating position;

a pivoting axle provided on the bucket crusher;

a compression and feeding plate journalled to be pivotable at an edge around said pivoting axle, said plate being pivotable by means of power units between a first and a second position whereby, in the first position of said plate there is a substantially larger angle between the plate and a plane extending through the shafts than in the second position of said plate in which the plate compresses the material to be crushed against the crushing tools and the shafts; and

wherein said rotating direction of the shafts and crushing tools is selected such that the crushing tools on a side of the shafts facing the plate travel towards a side of the bucket crusher which is provided with said pivoting axle.

5,485,690

LIGHTWEIGHT MODULAR SNOWPLOW FOR QUICK ATTACHMENT TO AND SIMPLE, ECONOMICAL OPERATION FOR SMALL VEHICLE

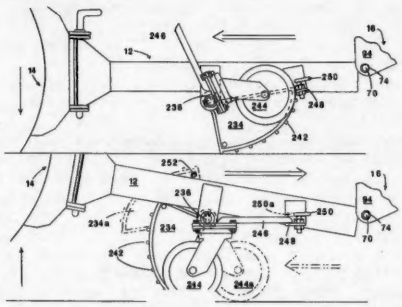
James P. MacQueen, 32 Valley St., Keene, N.H. 03431

Filed Jan. 18, 1994, Ser. No. 183,173
Int. Cl.[6] E01H *5/06*
U.S. Cl. 37—271 **11 Claims**

1. A lightweight modular snowplow assembly for a vehicle comprising in combination:

a vehicle mounting frame for mounting a snowplow to a vehicle, said vehicle mounting frame having means for releasably coupling and de-coupling said snowplow with said vehicle;

a triangular plow frame having a first double apex end releasably interconnectable with said coupling and de-coupling means of said vehicle mounting frame and a second opposite single apex end interconnected with a moldboard, said plow frame further having an axle mounted transversely on said plow



frame between said single apex end and said double apex end of said plow frame; and

means for raising and lowering said plow frame and said moldboard when said snowplow assembly is coupled for operation to said vehicle mounting frame of said vehicle, accomplished entirely and automatically as a result of forward and reverse motion of said vehicle to which said snowplow assembly is coupled; said means for raising and lowering comprising at least one biased cam, means for rotatably suspending said biased cam from said axle and means for preventing said biased cam from further rotation when said moldboard reaches its highest position from the ground surface,

wherein said biased cam comprises two straight sides and one convex curvilinear side,

each of said two straight sides having a first end and a second end, one of said two straight sides being longer than the other straight side, said two straight sides intersecting at said respective first ends at approximately a 90 degree angle with respect to each other, said intersection point of said two straight sides also connecting with said axle,

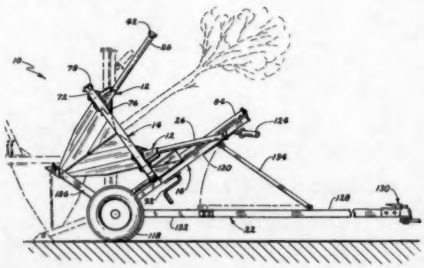
said one convex curvilinear side connecting the second ends of said two straight sides together in such a way that when said moldboard is resting on the ground surface, said second end of said shorter straight side is in contact with the ground surface.

5,485,691

APPARATUS FOR EXCAVATING AND TRANSPLANTING TREES AND THE LIKE AND METHOD OF USE

Timothy J. Stevens, Minnetonka, and David J. Kruskopf, Mound, both of Minn., assignors to EasyMove, Inc., Maple Plain, Minn.

Filed Aug. 24, 1994, Ser. No. 296,059
Int. Cl.[6] A01G *23/02*
U.S. Cl. 37—302 **32 Claims**



1. An apparatus for excavating and transplanting trees and other vegetation comprising:

at least two spade assemblies, each said spade assembly including a spade member slidably movable between a retracted

position and an extended position, each said spade member having a spade blade and a spade handle extending from said spade blade;

a ring assembly to which are removably mounted said spade assemblies, said ring assembly including a strength member, a first gate member and a second gate member;

manually actuable driving means for urging said spade members into the soil, said driving means being engageable with said spade handle of said spade member;

means for raising and lowering said ring assembly;

a support structure to which said ring assembly is removably mounted; and

means for attaching said support structure to a transporting means for transporting the excavating and transplanting apparatus from one location to another.

5,485,692

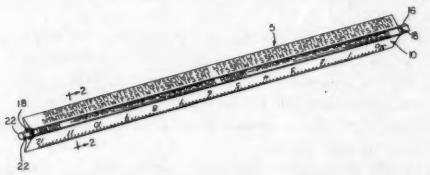
MULTIPLE YEAR CALENDAR

Douglas D. Seely, III, 69159 Pine Rd., North Liberty, Ind. 46554

Filed Jan. 10, 1994, Ser. No. 179,624

Int. Cl.[6] G09D *3/06*

U.S. Cl. 40—114 **7 Claims**



1. A calendar comprising first and second indexes each of parallel orientation, said first index placed next to said second index, said first index including a listing of various years of said calendar and multiple rows of chronological sequential days of multiple weeks, said years being in at least one column, each year in each said column being alignable with one of, said rows of chronological sequential days, said second index including a listing of the twelve months of a year and multiple rows of numbered days of each month, said twelve months being in a column, each of the twelve months being alignable with a said row of numbered days, each day of said numbered days in each of said twelve months being alignable with a day in a said row of chronological sequential days so aligned with a said year.

5,485,693

HINGED SUPPORT PANEL DISPLAY PRISM

Egbert Frenken, and Michael Schöning, both of Heinsberg, Germany, assignors to M & V Reklametechnik Schoning-Krieg, Heinsberg, Germany

Filed Mar. 22, 1994, Ser. No. 215,901

Claims priority, application Germany, Jul. 12, 1993, 43 23 200.0

Int. Cl.[6] G09F *11/02*

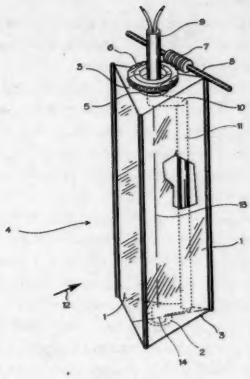
U.S. Cl. 40—505 **20 Claims**

1. A display device for displaying designs comprising:

(a) at least one assembled prism having at least three rectangular side panels having display surfaces thereon and extending parallel to the axis of said assembled prism, each said panel having two longitudinal edges and two ends with adjacent panels connected to each other along their respective adjacent longitudinal edges;

(b) end pieces each attached to a said end of at least one of two said panels to form with all said panels said assembled prism;

(c) a hinge joining a first panel to an adjacent third panel along adjacent longitudinal edges thereof;



(d) means releasably securing said third panel to an adjacent second panel along the longitudinal edge of said third panel opposite said hinge to allow opening of said third panel relative to said end pieces for accessing the interior of said assembled prism, wherein said end pieces remain attached to said at least one other than said third panel;

(e) means for rotating said assembled prism about its axis to present said panels individually for view; and

(f) illuminating means including at least one replaceable illuminating element disposed within said assembled prism to illuminate said panels and being replaceable when said third panel is open.

5,485,694

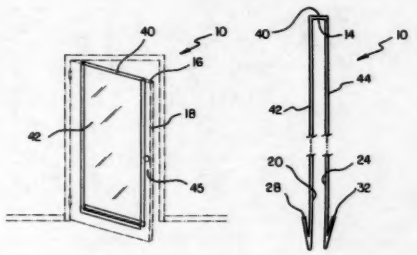
DOOR-MOUNTED POSTER SUPPORT

Sharon E. Goad, 429 Ritchie Dr., Nashville, Tenn. 37220

Continuation of Ser. No. 103,204, Aug. 9, 1993, abandoned. This application Jan. 23, 1995, Ser. No. 376,083

Int. Cl.[6] G09F *7/02*

U.S. Cl. 40—661 **12 Claims**



12. A door-mounted poster support apparatus comprising:

a U-shaped base member assembly which includes a middle base portion adapted to rest on an upper surface of a door which has a front and a back side depending perpendicularly downward from said upper surface, and which also includes a first flexible plastic hanging base member which is connected perpendicularly to a first side of said middle base portion and is sufficiently flexible so as to hang substantially vertically from said first side of said middle base portion for covering a substantial portion of either the front or back side of the door and a second flexible plastic hanging base member which is connected perpendicularly to a second side of said middle base portion and is sufficiently flexible so as to hang substantially vertically from said second side of said middle base

portion when said middle base portion rests on the upper surface of the door for covering a substantial portion of an opposite side of the door substantially covered by said first flexible plastic hanging base member,

a transparent U-shaped cover assembly which includes a middle cover portion adapted to rest on said middle base portion, and which also includes a first flexible plastic hanging cover member which is connected perpendicularly to a first side of said middle cover portion and which is sufficiently flexible so as to hang substantially vertically from said first side of said middle cover portion and which substantially covers said first flexible plastic hanging base member and a second flexible plastic hanging cover member which is connected perpendicularly to a second side of said middle cover portion and is sufficiently flexible so as to hang substantially vertically from said second side of said middle cover portion and which substantially covers said second flexible plastic hanging base member when said middle base portion rests on the upper surface of the door, and

a selectively closable and openable closure assembly located at respective bottom edges of said first flexible plastic hanging base member and said first flexible plastic hanging cover member for retaining a poster that is sandwiched between said first flexible plastic hanging base member and said first flexible plastic hanging cover member,

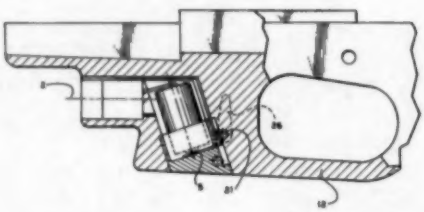
wherein said middle base portion and said middle cover portion are connected together by a quantity of adhesive material.

5,485,695

LASER AIMING DEVICE

Gaston Glock, Hausfeldstrasse 17, A-2232 Deutsch Wagram, Austria

Filed Sep. 20, 1994, Ser. No. 309,038
Claims priority, application Austria, Sep. 21, 1993, 1906/93
Int. Cl.[6] F41G *1/34*
U.S. Cl. 42—103 **5 Claims**



1. Laser sighting device for portable firearms, in which the sighting device includes a switch (**10**) that closes or opens a contact between two electrical conductors (**5**, **7**) and is arranged within a region of it trigger guard (**12**) comprising:

the switch (**10**) is arranged in a front region of the trigger guard (**12**) and compriaes a rotatable bolt (**21**) having a rotation axis that is arranged substantially perpendicular to an axis of a laser beam (**2**) associated with the laser sighting device:

the bolt (**21**) has a cam-like surface (**22**) such that the bolt deforms one of the two electrical conductors (**5** or **7**) in a resilient fashion in at least one angular position of the bolt in such a way that said one conductor (**5** or **7**) comes in contact with the other electrical conductor (**7** or **5**), and

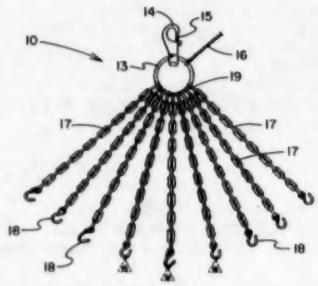
the electrical conductors (**5**, **7**) do not contact each other at least in one other angular position of the bolt.

5,485,696

FISHING LURE RETRIEVAL APPARATUS

Denny R. Barton, 1619 E. Longview La., Mustang, Okla. 73064

Filed Mar. 3, 1994, Ser. No. 205,176
Int. Cl.[6] A01K *97/00*
U.S. Cl. 43—17.2 **4 Claims**



1. A fishing lure retrieval apparatus comprising:

a rigid ring;

a snap hook slidably mounted onto the rigid ring, the snap hook including a hook entrance opening, with a slide bar slidably directed across the entrance opening to provide for an enclosed loop within the snap hook;

a flexible pull cable mounted to the rigid ring and extending from the rigid ring;

a plurality of lengths of chain cable slidably mounted along the rigid ring, with each chain cable having a first end secured to the rigid ring in a sliding relationship, and each chain cable having an outer distal end, each chain cable being secured to the rigid ring by an S-hook interposed between the first end of the respective chain cable and the rigid ring, the S-hook comprising a first member having a center portion and a lower end spaced from an upper end, the lower end of the first member being bent back in a first direction to abuttingly engage the center portion so as to define a lower loop projecting through a first chain link of the first end of the respective chain cable, and the upper end of the first member being bent back in a second direction opposite to the first direction to abuttingly engage the center portion so as to define an upper loop projecting through the ring, with the loops and the center portion of the first member all residing within a common plane, and further wherein the upper end of the first member projects downwardly beyond the lower end of the first member;

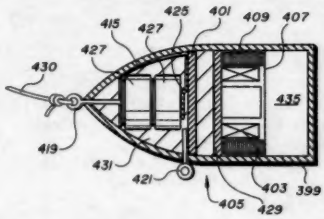
and,

a plurality of hook members, with an individual one of said hook members being coupled to an individual one of said lengths of chain cable at said outer distal end thereof, each of the hook members comprising a second member having a center portion and lower end spaced from an upper end, the lower end of the second member being bent back in a first direction upon the center portion of the second member so as to define a lower loop, the lower end of the second member being spaced from the center portion thereof, and the upper end of the second member being bent back in a second direction opposite to the first direction to abuttingly engage the center portion so as to define an upper loop projecting through a last chain link of the outer distal end of the respective chain cable, with the loops and the center portion of the second member all residing within a common plane.

5,485,697
FISHING LURE

Teddie G. Watson, Henderson, Nev., and Jeffrey L. Orth, Salt Lake City, Utah, assignors to Soundtech, Inc., Paso Robles, Calif.

Continuation-in-part of Ser. No. 837,662, Feb. 14, 1992, Pat. No. 5,237,771, which is a continuation of Ser. No. 715,730, Jun. 17, 1991, abandoned, which is a continuation of Ser. No. 587,251, Sep. 24, 1990, abandoned, which is a continuation of Ser. No. 354,917, May 22, 1989, Pat. No. 4,960,437. This application Jul. 8, 1992, Ser. No. 910,635
Int. Cl.[6] A01K *85/00*
U.S. Cl. 43—42.31 **57 Claims**

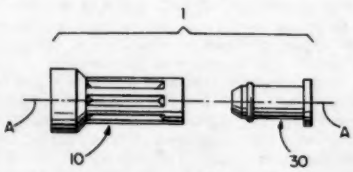


1. A fishing lure comprising:
a body having means for connecting at least one hook thereto;
operation means removably secured in said body, said operation means including
a water-resistant container with an enclosing wall,
securing means for securing said water-resistant container in said body,
an oscillator circuit positioned within said water-resistant container to generate patterned electrical signals,
battery means positioned within said water-resistant container to supply electrical power to said oscillator circuit, and
luring means mechanically associated with said water-resistant container and connected to said oscillator circuit to receive said patterned electrical signals, said luring means being structured and arranged to generate fish-attracting action in response to said signals; and
connecting means for connecting said body to structure operated by a remote operator.

5,485,698
TREE TREATMENT CAPSULE WITH RADIALLY EXPANDING SHANK PORTION

Hans A. K. Merving, August Stalbergsvag 10A, 644 00 Torshalla, Sweden

Continuation-in-part of Ser. No. 555,734, Jul. 23, 1990, Pat. No. 5,207,021, which is a continuation-in-part of Ser. No. 410,884, Sep. 22, 1989, Pat. No. 5,010,684, which is a continuation-in-part of Ser. No. 393,841, Aug. 7, 1989, Pat. No. 4,905,410, which is a continuation of Ser. No. 184,072, Apr. 20, 1988, abandoned. This application Jul. 30, 1990, Ser. No. 559,938
Int. Cl.[6] A01G *29/00*
U.S. Cl. 47—57.5 **10 Claims**

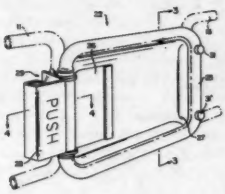


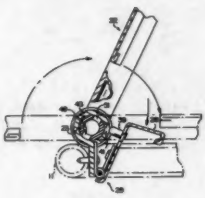
1. A tree treatment capsule for insertion into a bore in a tree comprising:
a plastic container having a shank with an internal cavity having an end opening containing therein a chemical agent and a head element integrally formed with said shank remote from said end opening, said shank including a circumferential recess formed therein;
a plastic plug for sealingly closing said internal cavity, said plastic plug having an outer external diameter slightly smaller than the diameter of said end opening;
said plug having a circumferentially extending ridge formed thereon and receivable in said circumferential recess such that said plug is only partially insertable into said end opening and so as to provide a tight fit between said plug and said end opening;
said shank having a plurality of recessed slots which are formed in the exterior surface thereof at circumferentially equal spacings, said slots extending longitudinally along a central portion of said shank between said end opening and said head element and allowing said shank to be broken so that as an impact force applied to said head element moves said head element towards said plastic plug, said plastic plug expands said central portion of said shank and breaks said shank along said recessed slots into a plurality of strips to form passages between said strips, thereby allowing said chemical agent to pass from said internal cavity through said passages.

5,485,699
HOSPITAL BED GUARD

Thomas S. Gabhart, Hookerton, N.C., assignor to Product Strategies, Inc., Duluth, Ga.

Division of Ser. No. 46,224, Apr. 13, 1993, Pat. No. 5,381,571. This application Jul. 27, 1994, Ser. No. 280,949
Int. Cl.[6] E05B *65/06*
U.S. Cl. 49—394 **7 Claims**





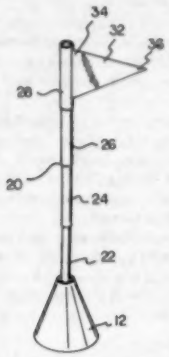
1. On a rotating closure, movable between a first position and a second position, a lock comprising:
a frame having a side section defining at least one pin channel;
a locking mechanism rotatably communicating with said frame;
a handle for accessing said locking mechanism;
a springe hinge;
an extension of said handle carrying said spring hinge;
at least one locking pin attached to said handle extension;
whereby pressure applied to said handle of said locking mechanism releases said at least one locking pin from said at least one pin channel, thereby allowing rotation between a first position and a second position.

5,485,700

TELESCOPIC FLAG AND CONE DEVICE

Brian M. Van Vranken, c/o A. Richards 2 Kirkner La., Watervliet, N.Y. 12189

Filed Sep. 28, 1994, Ser. No. 314,316
Int. Cl.[6] G09F *17/00;* **E04H** *12/32*
U.S. Cl. 52—40 **2 Claims**



1. A new and improved telescopic flag and cone device for providing clearly defined marker points for athletic drills comprising, in combination:

a cone portion having an open top, a closed bottom, an inner surface, and an outer surface, an X shaped support structure secured within the inner surface of the closed bottom, the X shaped structure functioning as a stabilizer for the device;

a pole portion having a first extent, a second extent, a third extent, and a fourth extent, the first extent received through the open top of the cone portion and secured to the X shaped support structure thereof, the second extent telescopically receiving the first extent nested therein, the third extent telescopically receiving the second extent nested therein, the fourth extent telescopically receiving the third extent nested therein, the fourth extent having a securement slot therein;

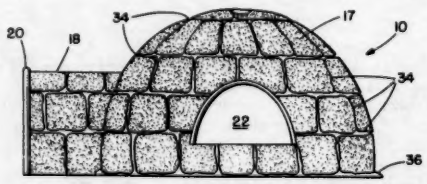
a flag portion having a first end and a second end, the first end having a rigid member theresecured, the rigid member received through the securement slot of the fourth extent of the pole portion for securement therewith, the second end optionally wrapping around the fourth extent permitting the fourth extent to be telescopically received within the cone for storage purposes.

5,485,701

TOY IGLOO

Thomas L. Hecht, 19 Deepwood Rd., Wilton, Conn. 06897

Filed Sep. 6, 1994, Ser. No. 300,759
Int. Cl.[6] E04B *1/32;* **A63H** *33/32*
U.S. Cl. 52—80.1 **4 Claims**



1. An igloo mold for making a child's snow igloo comprising:

a plurality of curved sections adapted to be secured together at the edges thereof to form the contour of an igloo of substantially hemispherical shape;

a first of said sections having an opening passing therethrough;

curved entry member means secured to said first section at the edge of the opening therethrough and extending outward from the first section to form an entry tunnel;

a second and third of each of said sections, each having an opening passing therethrough;

curved window member means secured to each of said second and third section at the edge of the respective openings therethrough and extending outward to form windows;

the outer surfaces of the plurality of sections having a grid of indentations in the form of the edges of snow blocks whereby snow may be packed on the said outer surfaces and held in place; and

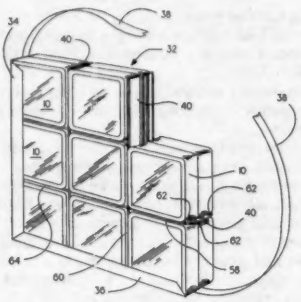
the outer surfaces of the plurality of sections being rough to facilitate the sticking thereto of falling snow.

5,485,702

MORTARLESS GLASS BLOCK ASSEMBLY

Bernard C. Sholton, Coral Gables, Fla., assignor to Glenn Sholton, Coral Gables, Fla.

Filed Mar. 25, 1994, Ser. No. 217,925
Int. Cl.[6] E04C *1/42*
U.S. Cl. 52—308 **13 Claims**



6. A panel of glass blocks, comprising:

a plurality of generally rectangularly-shaped glass blocks having horizontal and vertical edges having lips therealong, each edge having a central seam running therealong, said glass blocks being arranged to form a glass block panel in which horizontally adjacent blocks have abutting vertical edges and vertically adjacent blocks have abutting horizontal edges;

a strap extending around the perimeter of said glass block panel;

a plurality of horizontally extending spacers interposed between said abutting horizontal edges and a plurality of vertically extending spacers interposed between said abutting vertical edges to provide a uniform spacing between said adjacent glass blocks, each of said spacers having:

first and second oppositely positioned channel portions defining a first end and a second end, said channel portions sharing a common wall,

first and second oppositely positioned curved portions extending horizontally from said first end of said channel portions and forming a U-shaped configuration opening towards said channel portions which is configured to form a friction fit with adjacent glass blocks,

a first pad extending from a junction between said first and second oppositely positioned curved portions,

third and fourth oppositely positioned curved portions extending horizontally from said second end of said channel portions and forming a U-shaped configuration opening towards said channel portions which is configured to form a friction fit with adjacent glass blocks,

a second pad extending from a junction between said third and fourth oppositely positioned curved portions,

and wherein the width of said spacer is less than the width of said glass blocks such that the lips of the adjacent blocks

contact said first and second pads to form a groove between adjacent glass blocks; and

a sealant positioned in said groove.

5,485,703

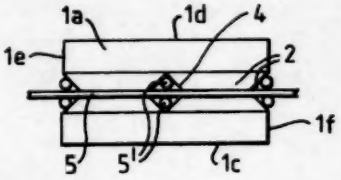
CONSTRUCTION ASSEMBLY INCLUDING A RECTANGULAR BLOCK FOR DRY WALLING OR THE PERMANENT CONSTRUCTION OF A WALL OR PARTITION

Willy Nordahl, Opseth, Rute 975, N-2400 Elverum, Norway

Filed Jul. 20, 1994, Ser. No. 277,636

Int. Cl.[6] E04C *1/10*

U.S. Cl. 52—562 **3 Claims**



1. A construction assembly comprising in combination a rectangular block and at least one reinforcing rod, said block having on four sides thereof V-shaped slots extending lengthwise of each of said four sides, and a reinforcing rod disposed in at least one of said V-shaped slots, the reinforcing rod being so dimensioned relative to the V-shaped slot in which it is disposed, that the rod contacts the side walls of the V-shaped slot above the bottom of the slot, thereby to leave a space between the rod and the bottom of the slot.

5,485,704

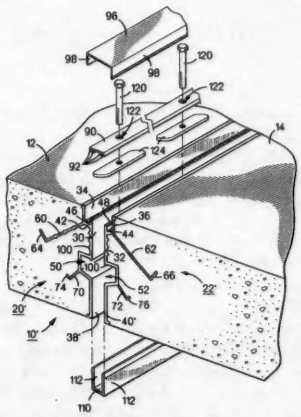
JOINING MEANS AND METHOD FOR CAST PANELS

Frederick J. Sandor, Sr., 407 St. George Ct., Satellite Beach, Fla. 32937

Filed May 10, 1994, Ser. No. 240,258

Int. Cl.[6] E04B *2/00*

U.S. Cl. 52—584.1 **18 Claims**



1. A system for joining first and second cast panels, comprising:

(a) first and second main structural members, cast into and extending along opposing, spaced apart edges of said first and second panels, respectively, and defining a cavity therebetween;

(b) a first locking member engagable with upper portions of each of said first and second main structural members to secure said first and second panels against movement toward or away from one another;

(c) a second locking member engagable with medial portions of each of said first and second main structural members; and

(d) a third locking member extending between said first and second locking members to draw said first and second locking members together and lock together said first and second panels.

5,485,705

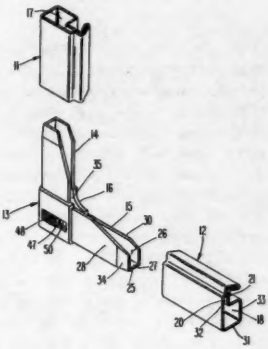
CORNER ASSEMBLY FOR A SCREEN FRAME

Guy Guillemet, Tenebonne, Canada, assignor to Bay Mills Ltd., Ontario, Canada

Division of Ser. No. 122,887, Sep. 16, 1993. This application Mar. 23, 1995, Ser. No. 409,353

Int. Cl.[6] E06B *9/00*

U.S. Cl. 52—656.9 **7 Claims**



1. A corner assembly for a frame for a screen or the like, with the assembly comprising a corner connector having a corner junction and a pair of connector arms disposed at approximately 90° relative to each other; with said connector arms being spaced apart from each other by said corner junction, and with said corner junction including at least one exterior face, with the corner connector having a slideway therein disposed parallel to, and at least partially within one of its said arms; with a slide member carried in said slideway in sliding engagement with said slideway, between extended and retracted positions therein; with said slide member having a retaining protrusion extending therefrom, in a direction generally parallel to said slideway; said protrusion extending in protruding relation beyond said corner connector in the extended position of said slide member and being substantially entirely disposed in retracted relation within said corner connector in the retracted position of said slide member; and including a retaining button carried by said slide member and being adapted to be manually engaged by a user for moving said slide member between extended and retracted positions thereof, including an elongated opening in the exterior face of the corner junction, generally parallel with said slideway and connecting said slideway with the exterior of said corner junction, and with said retaining button extending from said slide member to the exterior of the corner junction through said opening, for traversal of said button along said opening as said slide member moves between retracted and extended positions.

5,485,706

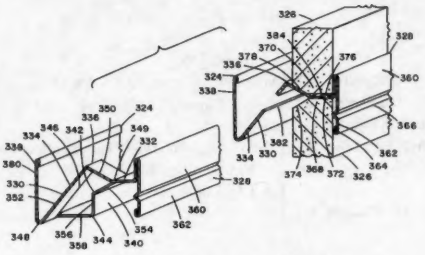
OFFSET FORMING OF STRUCTURAL COMPONENTS

Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Charlotte, N.C.

Continuation of Ser. No. 20,969, Feb. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 858,797, Mar. 27, 1992, abandoned. This application Jul. 21, 1994, Ser. No. 278,559

Int. Cl.[6] F04C *3/36*

U.S. Cl. 52—731.5 **16 Claims**



1. An elongate, structural, sheet metal member for use with flat boards having edges, comprising an elongate, narrow strip of sheet metal formed into an elongate structural member, said strip of sheet metal including at least three elongate sections, including a central web section between two side flange sections, said two flange sections being substantially parallel, and said web section extending between and connecting said flange sections, said central web section comprising a substantially flat portion attached to one of said flanges and extending substantially perpendicular to said flanges and a plurality of alternating deformed portions and undeformed portions angling in opposite directions between said flat portion and the other of said flanges, said deformed portions each being defined by a pair of substantially lateral slits and a pair of substantially longitudinal bends, said lateral slits having an extent generally perpendicular to the elongate extent of said structural member, said deformed portions including a major portion thereof disposed on an opposite side of an imaginary plane extending through said bends from said undeformed portions, whereby added stability is provided by said deformed portions, and board receiving spaces being formed between said one of said flanges and both sides of said flat portion.

5,485,707

METHOD AND APPARATUS FOR RELIEVING HYDROSTATIC PRESSURE FROM UNDER A SWIMMING POOL

Kenneth Wilkes, 724 Van Auken St., Elmhurst, Ill. 60126

Filed Jun. 15, 1994, Ser. No. 260,060

Int. Cl.[6] E04B *1/00*

U.S. Cl. 52—741.3 **1 Claim**

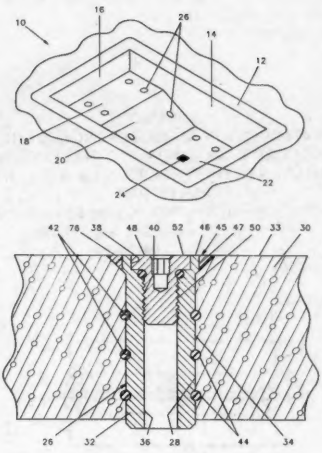
1. The method of relieving hydrostatic pressure under an in-ground swimming pool having a shallow end comprising the steps of

boring a plurality of holes in the shallow end of a swimming pool,

inserting into each of said borings a sleeve for receiving a removable plug,

inserting said removable plug into said sleeve such that it is flush with an inner surface of said pool, and

removing said removably plug when hydrostatic pressure is to be relieved.



5,485,708

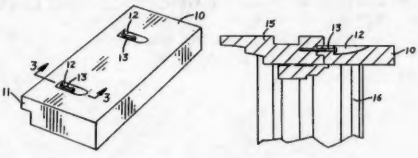
EXTENSION JAMB KIT

Flint S. Johnson, 645 5th Ave. South, South St. Paul, Minn. 55075

Filed Sep. 26, 1994, Ser. No. 312,398

Int. Cl.[6] E04B *1/00*

U.S. Cl. 52—745.16 **13 Claims**



1. A ready-to-use extension jamb, said extension jamb having a one end with an opening therein for abutment and engagement to a building frame and an opposite free end with no opening therein, said extension jamb having a top surface with a recess therein, said extension jamb one end engageable with the building frame with the opposite free end cantilevreable from said building frame extension jamb having a further opening therein communicating with the recess, with; and

a fastener temporarily secured in a ready to apply position within the opening in the extension jamb by engagement between the fastener and the extension jamb said fastener located in the recess and below said top surface, so that one can handle the extension jamb without disturbing the fastener to enable the fastener to remain in a ready-to-use position in the recess so one can quickly drive the fastener through a portion of the extension jamb and into the building frame to secure the extension jamb to the building frame with the fastener engaging the one end and extending into the building frame to support the extension jamb in a cantilever fashion therefrom.

5,485,709

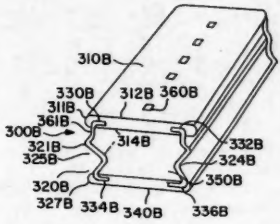
INSULATING SPACER FOR CREATING A THERMALLY INSULATING BRIDGE

Guy Guillemet, Terrebonne, Canada, assignor to Bay Mills Limited, Quebec, Canada

Continuation of Ser. No. 813,577, Dec. 26, 1991, Pat. No. 5,313,762. This application Jan. 31, 1994, Ser. No. 189,145

Int. Cl.[6] E04C *2/54*

U.S. Cl. 52—786.13 **26 Claims**



1. An insulating spacer for creating a thermally insulating bridge between spaced apart panes of a multiple pane unit, the insulating spacer comprising:

a top bridge member for providing the sole contact of the spacer with spaced apart panes of the multiple pane unit, the top bridge member consisting essentially of one of a synthetic resin material and a composite synthetic resin material and having an upper surface and a lower surface substantially parallel to the upper surface;

a metallic first leg member and a metallic second leg member for supporting said bridge member, a portion of each leg member adhering onto lower surface of the top bridge member, and each leg member extending from that lower surface such that it is adapted to remain free from contact with the spaced apart panes;

a bottom bridge member which cooperates with each of the first and second leg members; and

a channel portion comprising a configuration in which the upper portion consists essentially of the top bridge member and the rest of the configuration comprises the first and second leg members and the bottom bridge member.

5,485,710

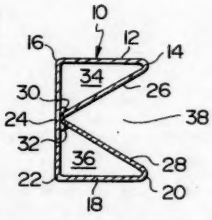
INSULATED GLASS SPACER WITH DIAGONAL SUPPORT

Luc Lafond, 23 Woodvalley Drive, Etobicoke, Ontario M9A 4H4, Canada

Filed Apr. 8, 1994, Ser. No. 224,416

Int. Cl.[6] E06B *7/12*

U.S. Cl. 52—204.593 **11 Claims**



1. The spacer for spacing glass substrates in an insulated glass assembly, comprising:

a one-piece plastic C-shaped body including:

a base having first and second opposed sides;

an arm integrally connected at a first end to a respective side of said base, each arm having an opposed end, each said arm adapted for engaging a substrate, each said arm being in a spaced parallel relationship relative to one another from said first end to said opposed end, each arm at said opposed end including a partitioning member, said partitioning member including a free end and the partitioning members extending towards one another to converge at a point of contact on said base, said partitioning members and said arms forming a plurality of trigonal spaces within said C-shaped body.

5,485,711

BINDING MACHINE

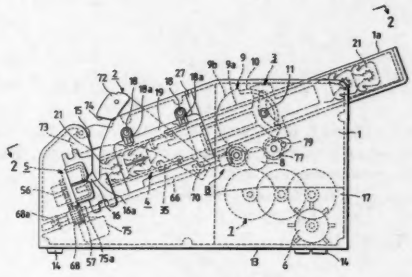
Seiichi Suzuki, and Keijiro Murayama, both of Tokyo, Japan, assignors to Max Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1994, Ser. No. 293,249

Claims priority, application Japan, Aug. 20, 1993, 5-049912 U; Aug. 20, 1993, 5-049913 U

Int. Cl.[6] B65B *61/14*

U.S. Cl. 53—138.4 **5 Claims**



1. A binding machine for binding a puckered mouth of a bag, said binding machine comprising:

a body having a groove therein for placing the puckered mouth of a bag in contact with a binding piece;

a feeding passageway for a binding piece belt, which belt includes binding pieces each of which is a flat plate of elastic material having a first opening substantially at the center into which the puckered mouth of the bag is inserted, a second opening communicated with said-first opening and extended to an outer edge of the flat plate, and a pair of locking wings provided on both sides of said second opening, said binding piece being located at the top of the binding piece belt on the puckered mouth of a bag to bind the puckered mouth of the bag therewith, said binding-piece feeding passageway having a central axis;

a slider assembly reciprocated in said binding-piece-belt feeding passageway to feed said binding piece to a front end of said binding-piece-belt feeding passageway, said slider assembly including means for curving said binding piece;

a binding-piece engaging mechanism provided at the front end of said binding-piece-belt feeding passageway including a crosswise engaging arm which is rotatable, and a pair of jigs which are fixed;

means for holding said crosswise engaging arm in a predetermined angular position with respect to said jigs; and

means for rotating said crosswise engaging arm, wherein

said crosswise engaging arm is extended rearwardly from the front end of said binding-piece-belt feeding passageway when said crosswise engaging arm is held at said predetermined angular position, said pair of locking wings of said binding piece are inserted into said binding-piece engaging mechanism by said slider assembly in such a manner that said locking wings cross said crosswise engaging arm through said second opening,

said binding piece engages the puckered mouth of a bag through said first opening,

said jigs are set adjacent to and in front of said crosswise engaging arm and, when said crosswise engaging arm is at

said predetermined angular position, said jigs are located angularly ahead of said crosswise engaging arm in the direction of rotation of said crosswise engaging arm, and

in binding the puckered mouth of the bag with said binding piece, said crosswise engaging arm is rotated by said rotating means around the central axis of said binding-piece-belt feeding passageway from said predetermined angular position so that one of said pair of locking wings of said binding piece, while being in contact with a corresponding one of said pair of jigs, is guided by said corresponding jig in such a manner that said one locking wing is crosswise engaged with said other locking wing which is fixedly supported by the other jig, whereby said binding piece is curved by said curving means in such a manner that after said locking wings are locked to one another said binding piece is substantially conical, the convex side thereof opening in the same direction as the opening of the bag with said first opening engaged with the puckered mouth of the bag at the top.

5,485,712

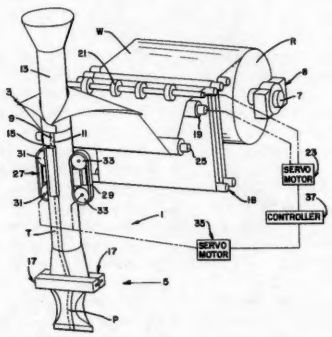
METHOD OF HANDLING FILM ON A VERTICAL FORM, FILL AND SEAL MACHINE

Dale M. Cherney, Howards Grove, and Keith Hopkins, Sheboygan, both of Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Jan. 27, 1995, Ser. No. 379,849

Int. Cl.[6] **B65B** *9/20;1/22;1/24*

U.S. Cl. 53—436 **26 Claims**



1. A method of maintaining tension on a flexible film as it passes in any direction over a forming shoulder of a vertical form, fill and seal machine, the machine including a source of film, a measuring axis for conveying the film and measuring a predetermined amount of the film, a forming shoulder for forming the film into a tube, a pull axis for conveying the tube, and a finishing system for sealing and severing successive packages from the tube into finished packages of desired lengths, the method comprising the steps of

a. operating the measuring axis and the pull axis in a forward direction while pulling the film over the forming shoulder to form said tube and maintaining the tube in tension downstream of the forming shoulder to retain tension in the film as it passes over the forming shoulder in the forward direction,

b. operating the measuring axis in a reverse direction while maintaining the tube in tension downstream of the forming shoulder to retain tension in the film as it passes over the forming shoulder in the reverse direction.

5,485,713

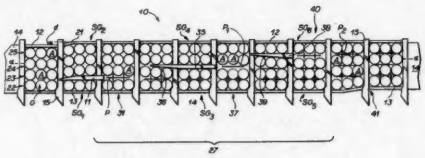
METHOD AND APPARATUS FOR INSERTING PARTITIONS INTO ARTICLE GROUPS

Frank Moncrief, Acworth, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Jul. 14, 1994, Ser. No. 274,929

Int. Cl.[6] **B65B** *35/44;61/00*

U.S. Cl. 53—445 **29 Claims**



1. A method for inserting partitions into a group of articles, comprising the steps of:

(a) combining articles with article selectors to form an article group of predetermined configuration, including rows of articles;

(b) conveying said article group and in a direction along a path of travel;

(c) creating with a first divider disposed above said article selectors a first article subgroup and a second article subgroup by separating at least one row of articles from said article group;

(d) inserting a first partition between said first article subgroup and said second article subgroup; and

(e) recombining said first article subgroup with at least a portion of said second article subgroup.

5,485,714

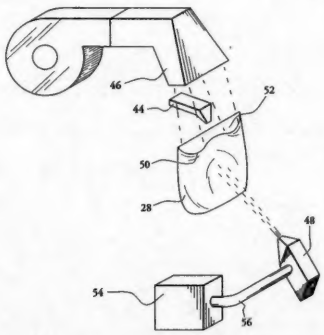
DISK LOADER HAVING A SIDE AIR BLAST FOR PROPER BAG PRESENTATION

Samuel A. Montalvo, 18750 Barnhart Ave., Cupertino, Calif. 95014

Filed Feb. 27, 1995, Ser. No. 395,056

Int. Cl.[6] **B65B** *43/36;43/26;61/00*

U.S. Cl. 53—459 **18 Claims**



1. A method of loading disks in a flexible bag comprising the steps of:

directing a continuous flow of air into an opening of said flexible bag such that a pocket between opposed first and second sides of said flexible bag is at least partially exposed;

striking an exterior surface of said first side of said flexible bag with a blast of gas such that said first side is pressed toward said second side;

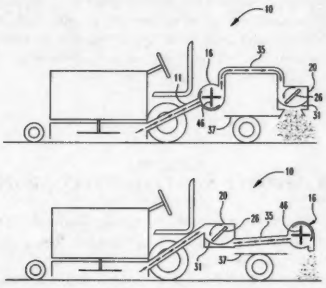
terminating said blast, thereby allowing said continuous flow of air to reshape said opening such that said pocket is exposed; and

inserting disks into said pocket of said flexible bag.

5,485,715
GRASS AND LEAF ERADICATOR

Harlan Breeden, 4119 Leonard Springs Rd., Bloomington, Ind. 47403

Filed Nov. 14, 1994, Ser. No. 338,035
Int. Cl.[6] A01D *34/82*
U.S. Cl. 56—13.3 **19 Claims**



11. An apparatus for preparing mulch, comprising:

(a) a tractor with a mower-deck, wherein said mower-deck has at least one rotatably mounted cutting blade;

(b) a powered blower having an inlet and an outlet;

(c) an inlet duct adapted to guide grass and leaf clippings from said mower-deck and into the inlet of said blower;

(d) a powered hammer mill located downstream of said blower and having an entrance and an exit;

(e) an interconnecting duct fixedly mounted between said blower and said hammer mill.

18. A method for preparing mulch from grass, leaves, sticks, or similar debris, comprising the steps of:

(a) cutting the grass, leaves, sticks or similar debris with a lawn mower whereby clippings are formed;

(b) blowing said grass clippings from the discharge of said lawn mower into the entrance of a hammer mill utilizing a centrifugal fan;

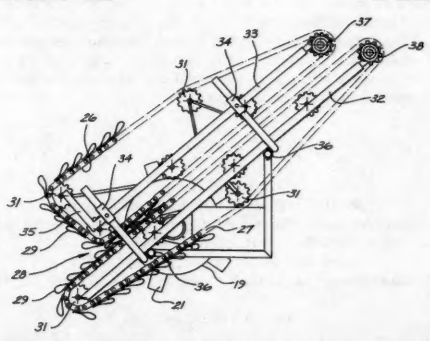
(c) pulverizing said grass clippings into a mulch with said hammer mill; and

(d) discharging the mulch from said hammer mill.

5,485,716
DOUBLE ROW CANE HARVESTER

Malcolm J. Baker, Bundaberg, Australia, assignor to Autoft Industries, Limited, Queensland, Australia

Filed Sep. 6, 1994, Ser. No. 301,109
Claims priority, application Australia, Sep. 7, 1993, PM 1079
Int. Cl.[6] A01D *45/10*
U.S. Cl. 56—14.3 **17 Claims**



1. A harvester for cane stalks which are planted in substantially parallel rows, comprising:

a frame having a first and a second side;

a first basecutter assembly, mounted rearwardly of a crop gathering area and coupled to the frame between its first and second sides, for severing a first row of cane stalks;

crop feeding means mounted immediately behind the first basecutter assembly that lift and feed the severed stalks to a chopping area that chops the stalks into billets;

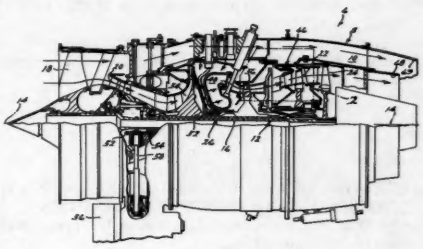
a second basecutter assembly, mounted forwardly and outwardly from the first side of the frame, arranged to sever cane stalks in a row substantially parallel to the first row of cane stalks; and

conveying means for transporting the cane stalks severed by the second basecutter assembly to a position proximate the first row of cane stalks such that the crop feeding means in addition to lifting and feeding the first row of cane stalks, lifts and feeds the severed cane stalks, transported from the substantially parallel row, to the chopping area.

5,485,717
MULTI-SPOOL BY-PASS TURBOFAN ENGINE

Gregg G. Williams, Milford, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Jun. 29, 1994, Ser. No. 267,616
Int. Cl.[6] F02K *3/02*
U.S. Cl. 60—39.03 **2 Claims**



2. A method of minimizing thrust while maximizing RPM of the high pressure spool of a multi-spool by-pass turbofan engine comprising the steps of

inducing air flow through a fan at the forward end of a low pressure spool having a low pressure turbine at an aft end thereof;

dividing the air flow from the fan on said low pressure spool between a high pressure compressor on a high pressure spool and a by-pass duct;

conducting air from said high pressure compressor to a combustor disposed between the high pressure compressor and a high pressure turbine on said high pressure spool;

conducting the combustion gas to the said high pressure turbine on said high pressure spool;

conducting a portion of the combustion gas from the high pressure turbine to the low pressure turbine;

bleeding a portion of the combustion gas from immediately behind the high pressure turbine on said high pressure spool to said by-pass duct at engine idle conditions to increase the expansion ratio across the high pressure turbine to maximize the RPM thereof at idle conditions while concomitantly reducing the expansion ratio across the low pressure turbine to reduce the speed of said low pressure spool and of the fan thereon thereby reducing idle thrust produced by the fan and reducing air mass flow to the high pressure compressor on said high pressure spool; and

driving an alternator by said high pressure spool.

5,485,718

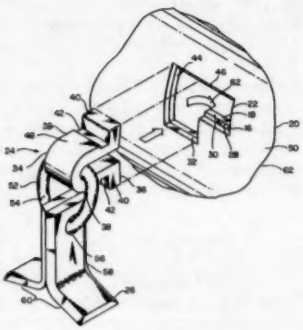
FLAIL CUTTER AND METHOD OF PROVIDING A FLAIL CUTTER FOR A BRUSH CUTTING MACHINE

Jimmie J. Dallman, 3709 99th Dr. S.E., Everett, Wash. 98205

Filed Nov. 17, 1994, Ser. No. 341,019

Int. Cl.[6] A01D *34/52*

U.S. Cl. 56—294 **27 Claims**



1. A flail cutter for a brush cutting machine, the flail cutter having blades and comprising:

a) a rotatable generally cylindrical member;

b) a plurality of one piece attaching means, each of the one piece attaching means directly attached to the generally cylindrical member; and

c) a plurality of holding means removably attached to the attaching means, each holding means holding at least one blade of the flail cutter.

5,485,719

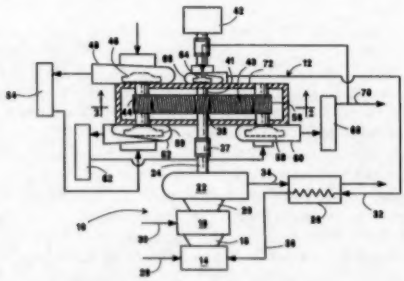
INTEGRATION OF COMBUSTOR-TURBINE UNITS AND INTEGRAL-GEAR PRESSURE PROCESSORS

James B. Wulf, Williamsville, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Division of Ser. No. 30,742, Mar. 12, 1993, Pat. No. 5,402,631, which is a continuation-in-part of Ser. No. 698,125, May 10, 1991, abandoned. This application Sep. 20, 1994, Ser. No. 308,907

Int. Cl.[6] F02C *3/08*

U.S. Cl. 60—39.07 **6 Claims**



1. A system for supplying a compressed gas stream to an air separation plant, comprising:

(a) a combustor-turbine unit having an output shaft;

(b) a first integral-gear pressure processor having:

(1) a bull gear;

(2) at least one integral-gear pressure processing stage for compressing said gas stream, said stage drivingly coupled to said bull gear and having an inlet and an exit;

(c) a conduit from one of said at least one integral-gear pressure processing stages, being connectable to the air separation plant, for withdrawal of a portion of said gas stream;

(d) a conduit from one of said at least one integral-gear pressure processing stages to said combustor-turbine unit, for ducting a portion of said gas stream to said combustor-turbine unit; and

(e) means for driving said bull gear with said combustor-turbine unit output shaft, said means comprising a driving pinion coupled to said combustor-turbine unit output shaft and meshing with said bull gear; or a driving pinion coupled to said combustor-turbine unit output shaft and meshing with another pinion meshing with said bull gear.

5,485,720

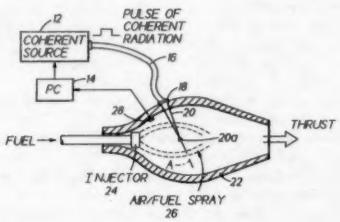
LASER INITIATED NON-LINEAR FUEL DROPLET IGNITION

Jimmy D. Few, and James W. L. Lewis, both of Tullahoma, Tenn., assignors to University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation of Ser. No. 957,613, Oct. 6, 1992, Pat. No. 5,404,712. This application Aug. 11, 1994, Ser. No. 289,184

Int. Cl.[6] F02C *7/264*

U.S. Cl. 60—39.821 **4 Claims**



1. An ignition system for igniting, within a combustion chamber, an air/fuel spray comprised of fuel droplets, the ignition system comprising:

means for generating at least one pulse of coherent radiation;

means for directing the at least one pulse into the air/fuel spray for initiating a development of a plasma within the air/fuel spray;

said generating means including pulse control means comprising means for maintaining the pulse of coherent radiation for pumping the developing plasma and means for terminating the pulse of coherent radiation at a time after the plasma has become self-sustained and before a time that an ignition of the air/fuel spray occurs, the ignition using ignition precursors that are created from the self-sustained plasma after the termination of the pulse; and

feedback means including sensor means for detecting a presence of a flame within the combustion chamber, an output of said sensor means being coupled to said generating means for causing said generating means to repetitively generate pulses of coherent radiation at least until a presence of a flame is detected by said sensor means.

5,485,721

ARCJET FOR A SPACE FLYING BODY

Manfred Steenborg, Ritterhude, Germany, assignor to ERNO Raumfahrttechnik GmbH, Bremen, Germany

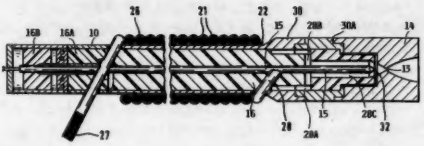
Filed Jun. 30, 1994, Ser. No. 268,807

Claims priority, application Germany, Jun. 30, 1993, 43 21 725.7

Int. Cl.[6] F03H *1/00*

U.S. Cl. 60—203.1 **5 Claims**

1. An arcjet propulsion plant for a space flying body, comprising a housing including an anode and an expansion nozzle forming a



restrictor, a cathode concentrically mounted and electrically insulated in said housing for igniting an arc between a tip of said cathode and said anode when a propellant flow exists, a recess forming a plenum chamber (**32**, **52**) in said anode housing upstream of said nozzle, said cathode tip reaching into said plenum chamber, an air gap spacing said cathode tip from said restrictor of said expansion nozzle, a propellant dissociation device (**21**, **41**) mounted to directly surround said housing, and flow paths connecting said dissociation device in series with said plenum chamber for introducing dissociated propellant into said plenum chamber through said flow paths, and wherein said dissociation device is formed as a tubular member (**21**, **41**) forming a decomposition chamber that is wound into a helix surrounding said housing, said flow paths having at least a radial portion (**28B**, **52B**) leading from an end of said helix to said cathode (**15**).

5,485,722

CATALYTIC DECOMPOSITION OF HYDROXYLAMMONIUM NITRATE-BASED MONOPROPELLANTS

Eckart W. Schmidt, Bellevue, Wash., and David F. Gavin, Cheshire, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Oct. 7, 1993, Ser. No. 132,980
Int. Cl.[6] C06D *5/00*
U.S. Cl. 60—219 **18 Claims**

9. A continuous process for the controlled generation of a gaseous propellant which comprises the steps of:

(a) passing a first measured amount of a hydroxylammonium nitrate-containing liquid into a reactor containing a solid catalyst selected from the group consisting of platinum group metals, transition group metals, and combinations thereof, to cause the hydroxylammonium nitrate to decompose into a high pressure gaseous product comprising water in the form of steam, carbon dioxide and nitrogen,

(b) controllably exhausting said high-pressure gaseous product from the reactor and maintaining the flow rate of hydroxylammonium nitrate-containing liquid into the reactor to cause the reactor chamber pressure to remain essentially constant, and

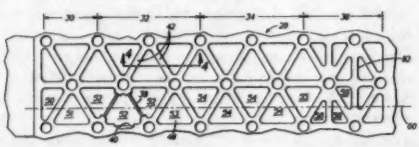
(c) repeating steps (a) and (b) in a continuous fashion.

5,485,723

VARIABLE THICKNESS ISOGRID CASE

Jeffrey P. McCoy, Ellington, and Allan R. Penda, Amston, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 29, 1994, Ser. No. 236,792
Int. Cl.[6] F02C *7/00*; F02K *3/04*
U.S. Cl. 60—226.1 **3 Claims**



1. A cylindrical isogrid fan containment case for a turbofan gas turbine engine comprising:

said case formed of an isogrid having a lattice of flanged ribs in isometric triangular relationship and having flanges on the outside edge of each rib;

a skin on the inside edge of said isogrid whereby triangular isogrid segments are formed between said ribs, thereby forming a plurality of axial rows of triangular segments;

a constant isogrid total thickness consisting of a skin thickness, a rib height plus a flange thickness; and

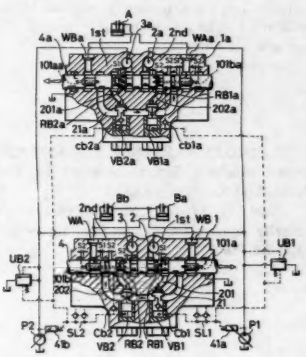
different triangular isogrid segments having different skin thicknesses and flange thicknesses, but the same rib height.

5,485,724

HYDRAULIC DRIVE SYSTEM

Yusaku Nozawa; Wataru Ohtsu; Nobuhiko Ichiki, all of Ibaraki; Kazuyuki Ino, Shimodate; Hiroshi Matsuzaki, Tsukuba, and Kinya Takahashi, Tsuchiura, all of, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00677, § 371 Date Dec. 14, 1993, § 102(e) Date Dec. 14, 1993, PCT Pub. No. WO93/24757, PCT Pub. Date Dec. 9, 1993
PCT Filed May 21, 1993, Ser. No. 162,142
Claims priority, application Japan, May 22, 1992, 4-130938
Int. Cl.[6] F16D *31/02*
U.S. Cl. 60—421 **5 Claims**



1. A hydraulic drive system, comprising first and second variable displacement hydraulic pumps (**P1**, **P2**), a first hydraulic actuator (**B**) driven by hydraulic fluids delivered from said first and second hydraulic pumps (**P1**, **P2**), a second hydraulic actuator (**C**) driven by the hydraulic fluid delivered from said second hydraulic pump, first variable restrictor means (**RB1**) for controlling a flow rate of the hydraulic fluid supplied from said first hydraulic pump to said first hydraulic actuator, second variable restrictor means (**RB2**) for controlling a flow rate of the hydraulic fluid supplied from said second hydraulic pump to said first hydraulic actuator, third variable restrictor means (**RC**) for controlling a flow rate of the hydraulic fluid supplied from said second hydraulic pump to said second hydraulic actuator, a first pressure compensating device (**VB1**) for controlling a differential pressure across said first variable restrictor means, a second pressure compensating device (**VB2**) for controlling a differential pressure across said second variable restrictor means, a third pressure compensating device (**VC**) for controlling a differential pressure across said third variable restrictor means, first delivery rate control means (**41*a***) for controlling a delivery rate of said first hydraulic pump, second delivery rate control means (**41*b***) for controlling a delivery rate of said second hydraulic pump, and a coupling circuit (**300**) for joining the flow rate passing through said first variable restrictor means and the flow rate passing through said second variable restrictor means with each other and supplying the joined flow rate to said first hydraulic actuator, wherein said system further comprises:

first sensor means (cb1) for detecting a pressure on an outlet side of said first pressure compensating device,

second sensor means (cb2) for detecting a pressure on an outlet side of said second pressure compensating device;

third sensor means (cc) for detecting a pressure on an outlet side of said third pressure compensating device;

first signal pressure supply means (SL1) for supplying the pressure detected by said first sensor means, as a first signal pressure, to said first delivery rate control means;

second signal pressure supply means (SL2) operated independently of said first signal pressure supply means for selecting a higher one of the pressure detected by said second sensor means and the pressure detected by said third sensor means, and supplying the selected higher pressure as a second signal pressure to said second delivery rate control means; and

opening/closing means disposed in said coupling circuit and switched over from a closed position to an open position in response to a shift from a sole operation of said first variable restrictor means (RB1) to a combined operation of said first and second variable restrictor means (RB1, RB2);

wherein an operating relationship between said first and second variable restrictor means (VB1, VB2) is set such that when a demanded flow rate of said first hydraulic actuator (B) is small, said first variable restrictor means is solely operated to supply only the hydraulic fluid from said first hydraulic pump (P1) to said first hydraulic actuator and when the demanded flow rate of said first hydraulic actuator is increased to exceed a predetermined value, said first and second variable restrictor means are both operated to supply both the hydraulic fluids from said first and second hydraulic pumps (P1, P2) to said first hydraulic actuator.

5,485,725

CONTINUOUSLY VARIABLE TRANSMISSION

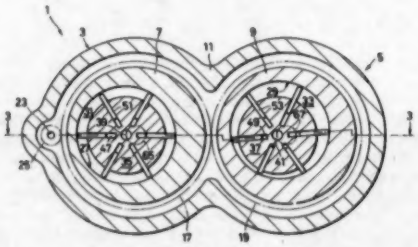
Masao Teraoka, Tochigi, Japan, assignor to Tochigi Fugi Sangyo Kabushiki Kaisha, Japan

Filed Feb. 17, 1993, Ser. No. 18,946

Claims priority, application Japan, Feb. 18, 1992, 4-030844; Sep. 7, 1992, 4-238186

Int. Cl.[6] F16D *39/00*

U.S. Cl. 60—491 **6 Claims**



1. A continuously variable transmission for continuously changing the speed of a rotative driving force conveyed thereto comprising:

a casing;

a vane pump for receiving the rotative driving force and discharging a variable amount of fluid, said vane pump having a first housing movably supported inside the casing, a first rotor with a rotor shaft secured to said casing and rotatably accommodated inside said first housing, and a plurality of vanes held by said first rotor;

a vane motor driven by the pressure of the fluid discharged from said vane pump., outputting a rotative speed, and constructed so as to return the fluid discharged therefrom to said vane pump, said vane motor having a second housing movably supported inside the casing, a second rotor with a rotor shaft secured to said casing and rotatably accommodated inside said second housing, and a plurality of vanes held by said second rotor;

an eccentricity-controlling mechanism for mutually moving said first and second housings so as to gradually decrease the eccentricity of the internal circumference of said first housing with respect to said first rotor while increasing the eccentricity of the internal circumference of said second housing with respect to said second rotor, or vice versa, to regulate the rotative speed output from said vane motor, wherein

said first housing has an internal circumference with a rotatable first axis which is eccentric with respect to an axis of a periphery of said first housing,

said second housing has an internal circumference with a rotatable second axis which is eccentric with respect to an axis of a periphery of said second housing, and

said eccentricity-controlling mechanism comprises a rotation mechanism for rotating said first and second housings.

5,485,726

PRESSURE CONTROL APPARATUS FOR STIRLING MODULE

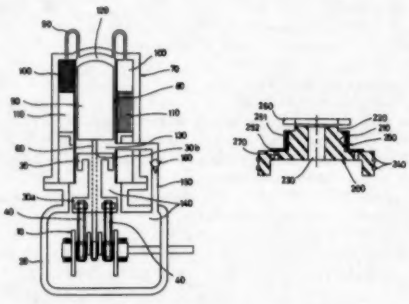
Dong K. Shin, Kyungki-do, and Sung T. Kim, Seoul, both of, Rep. of Korea, assignors to LG Electronics Inc., Rep. of Korea

Filed May 15, 1995, Ser. No. 441,453

Claims priority, application Rep. of Korea, May 17, 1994, 10845/1994; Aug. 29, 1994, 21424/1994

Int. Cl.[6] F01B *29/10;* **F02G** *1/04*

U.S. Cl. 60—519 **10 Claims**



1. A pressure control apparatus for a stirling module wherein a compression space is formed between a displacer and a piston in a cylinder and a bounce space formed below said piston in said cylinder, comprising:

a piston including a plurality of pressure control hole groups vertically extended within said piston for connecting between said compression space and said bounce space, each of groups consists of at least one hole;

a pressure control member supporting section having a diameter smaller than that of the piston and upwardly extended from the top of the piston;

a support member engaging section having a diameter smaller than that of said pressure control member supporting section and upwardly extended from the top of the support member engaging section; and

a pressure control member including an engaging section threadly engaged to said pressure control member supporting section and an opening/closing section having a plurality of wings.

5,485,727

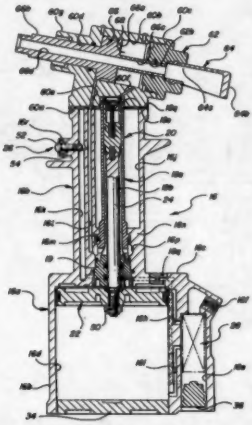
FASTENER INSTALLATION TOOL

Bruce T. Godfrey, Royal Oak, Mich., assignor to GBP Corporation, Warren, Mich.

Filed Nov. 14, 1994, Ser. No. 338,046

Int. Cl.[6] F15B *7/10*; B26B *13/00*

U.S. Cl. 60—572 **8 Claims**



1. A fastener installation tool including a housing assembly defining a head including a head bore, an air chamber, and a neck interconnecting the head and the air chamber and defining a neck bore; a head piston mounted in the head bore and adapted to be connected to a pulling head; a neck piston slidably mounted in the neck bore; an air piston mounted in the air chamber; a piston rod connecting the air piston to the neck piston; means for delivering pressurized air to the air chamber to selectively move the air piston in the air chamber and thereby move the neck piston in the neck chamber; first passage means interconnecting a location in the neck bore on one side of the neck piston and a location in the head bore on one side of the head piston; second passage means interconnecting a location in the neck bore on the other side of the neck piston and a location in the head bore on the other side of the head piston and coacting with the first passage means and the neck and head bores to define a closed loop hydraulic circuit; and hydraulic fluid filling the hydraulic circuit; characterized in that:

the neck piston is fixedly secured to one end of the piston rod; and

one of said neck and head pistons includes means operative to vary the volume of said one piston in response to variations in the hydraulic pressure acting against said one piston.

5,485,728

EFFICIENT UTILIZATION OF CHLORINE AND MOISTURE-CONTAINING FUELS

Norman L. Dickinson, Monte Sereno, Calif., assignor to EnerTech Environmental, Inc., Atlanta, Ga.

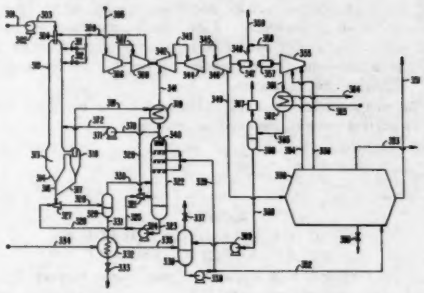
Continuation-in-part of Ser. No. 763,000, Sep. 20, 1991, Pat. No. 5,261,225, which is a continuation of Ser. No. 388,069, Jul. 21, 1989, Pat. No. 5,050,375, which is a continuation-in-part of Ser. No. 123,280, Nov. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 813,486, Dec. 26, 1985, Pat. No. 4,714,032. This application Nov. 15, 1993, Ser. No. 152,796

Int. Cl.[6] F01K *17/00*

U.S. Cl. 60—648 **45 Claims**

1. A continuously operable method of utilizing the energy of a relatively low-grade carbonaceous fuel having a fuel value comprising the steps of:

providing the fuel in a slurry;



pressurizing the slurry to keep it substantially in its liquid state;

heating the pressurized slurry to a temperature at which a substantial portion of oxygen chemically bound in molecules of the carbonaceous fuel splits off as carbon dioxide, thereby forming a char slurry including char particles derived from the fuel and an evolved gas;

reacting the char particles with a gas including oxygen to thereby convert the fuel value of the char particles of the slurry into thermal energy; and

using the thermal energy.

5,485,729

AIR SEPARATION

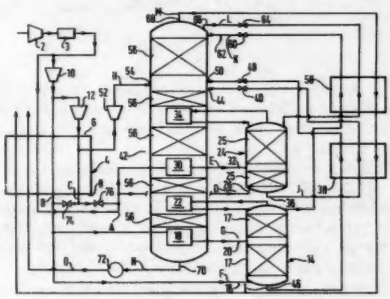
Paul Higginbotham, Guilford, England, assignor to The BOC Group plc, Windlesham Surrey, United Kingdom

Filed Dec. 13, 1994, Ser. No. 354,983

Claims priority, application United Kingdom, Dec. 15, 1993, 9325648

Int. Cl.[6] F25J *3/02*

U.S. Cl. 62—25 **21 Claims**



1. A method of separating air, comprising:

separating nitrogen from a first stream of compressed air in a higher pressure rectification column;

separating nitrogen from a second stream of compressed air in an intermediate pressure rectification column;

introducing oxygen-enriched liquid air into a lower pressure rectification column;

withdrawing from the lower pressure rectification column an impure oxygen product separated therein from the oxygen-enriched liquid air;

supplying liquid nitrogen reflux to each rectification column;

condensing a part of the first air stream upstream of the higher pressure rectification column by indirect heat exchange with a first liquid stream withdrawn from mass exchange in the lower pressure rectification column;

condensing nitrogen taken from mass exchange in the higher pressure rectification column by indirect heat exchange with a second stream of liquid withdrawn from mass exchange in the

lower rectification column and condensing a part of the second air stream upstream of the intermediate pressure rectification column by indirect heat exchange with a third stream of liquid withdrawn from mass exchange in the lower pressure rectification column;

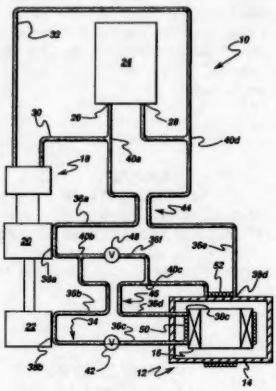
the first, second and third streams of liquid being all of a different composition from one another.

5,485,730

REMOTE COOLING SYSTEM FOR A SUPERCONDUCTING MAGNET

Kenneth G. Herd, Niskayuna, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 10, 1994, Ser. No. 288,178
Int. Cl.[6] F25B *19/00*
U.S. Cl. 62—51.1 **6 Claims**



1. A cooling system for a superconductive magnet having a thermal shield and having a superconductive coil disposed generally within and spaced apart from said thermal shield, said cooling system comprising:

a) a cryocooler coldhead disposed outside and spaced apart from said magnet and having a first stage and a second stage, wherein said second stage is colder than said first stage;

b) a compressor disposed outside and spaced apart from said magnet and having an outlet port and an inlet port; and

c) a helium-gas conduit circuit having:

(1) a first helium-gas path extending from said outlet port of said compressor to a first location which is in proximate thermal contact with said first stage of said cryocooler coldhead;

(2) a second helium-gas path extending from said first helium-gas path at said first location to a second location which is in proximate thermal contact with said second stage of said cryocooler coldhead;

(3) a third helium-gas path extending from said second helium-gas path at said second location to a third location which is in proximate thermal contact with said superconductive coil of said magnet;

(4) a fourth helium-gas path extending from said third helium-gas path at said third location to a fourth location which is in proximate thermal contact with said thermal shield of said magnet;

(5) a fifth helium-gas path extending from said fourth helium-gas path at said fourth location to said inlet port of said compressor, and

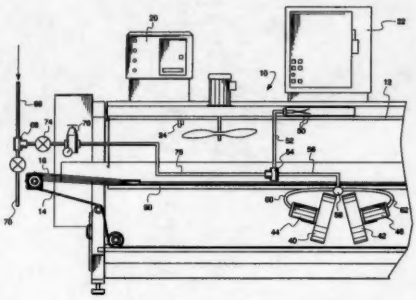
wherein said helium-gas paths are distinct from each other.

5,485,731

PROTECTION FOR MOTORS IN REFRIGERATED ENVIRONMENTS

Jim M. Venetucci, Forest Park, Ill., and Horst Spaeth, Rogers, Ark., assignors to Liquid Carbonic Corporation, Oak Brook, Ill.

Filed Jul. 6, 1994, Ser. No. 271,165
Int. Cl.[6] F25D *17/00*
U.S. Cl. 62—56 **21 Claims**



21. A method for cooling products, comprising the steps of:

providing a source of coolant gas;

providing an enclosure having an interior;

providing gas release means for releasing gas within the enclosure to cool the enclosure interior;

coupling the source of coolant gas to the gas release means;

circulating the environment within the enclosure with an electric fan having an electric motor located within the enclosure;

providing the electric motor with an enclosing casing defining an interior volume;

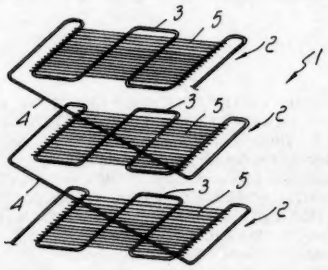
coupling the source of coolant gas to the electric motor and flowing coolant gas through the electric motor.

5,485,732

HEAT EXCHANGER, PARTICULARLY FOR USE AS A RACK EVAPORATOR IN REFRIGERATORS OR FREEZERS, AND PROCESS FOR MANUFACTURING IT

Vincenzo Locatelli, Lecco, Italy, assignor to Condenser Italiana S.R.L., Italy

Filed Jan. 14, 1994, Ser. No. 181,489
Claims priority, application Italy, Jan. 25, 1993, MI93A0111
Int. Cl.[6] F25B *39/00*
U.S. Cl. 62—520 **8 Claims**



1. A rack heat exchanger for use as a rack evaporator in refrigerators, freezers and the like comprising:

a plurality of stacked shelves defining superimposed planes;

a plurality of serpentine coils, with a serpentine coil for each of said shelves, each of said serpentine coils being constituted by at least one tubular body, said tubular body extending along a

serpentine path in which bends alternate with straight branch portions, said serpentine path extending in a same one of said planes;

a plurality of supporting and heat-exchange enhancing structures, with a supporting structure for each of said shelves, each of said structures being connected to a respective one of said serpentine coils for allowing that at least an end branch portion of said serpentine coils freely and elastically twists about a longitudinal axis of said tubular body constituting said branch portion;

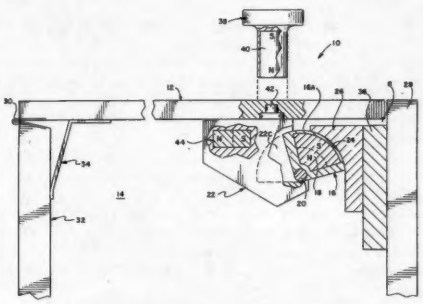
a plurality of tubular portions being in fluid communication with said serpentine coils, each of said tubular portions connecting the serpentine coil end branch portion of a shelf with an end branch of a contiguous underlying serpentine coil, the tubular portion extending in a generally diagonal direction from a first corner of a shelf to a second corner of a further underlying shelf, said second corner being opposite to a corner of said further shelf which is immediately underlying said first corner.

5,485,733

CONCEALED MAGNETIC LOCK FOR CABINET CLOSURE

Charles G. Hoffman, 204 Sentry Dr. North, Mansfield, Tex. 76063

Filed May 13, 1993, Ser. No. 60,645
Int. Cl.[6] E05B *47/00;* **E05C** *17/56*
U.S. Cl. 70—276 **19 Claims**



1. A magnetic lock comprising:

a pivotal latch attached pivotally at a latch axis to a latch housing that: is attachable to a closure member in closure relationship to a compartment;

a latch plate attachable to a latch panel;

a latch magnet having a first magnetic pole proximate the latch axis and a second magnetic pole positioned outward radially from the first magnetic pole on the pivotal latch;

a reset magnet positioned on the latch housing in like-pole-to-like-pole magnetic-repulsion relationship to the second magnetic pole of the latch magnet, such that magnetic repulsion between the reset magnet and the latch magnet actuates the pivotal latch pivotally in latch-engageable contact with the latch plate;

a magnetic handle having a magnetic-actuation end with a key magnet having a magnetic pole in opposite-pole-to-opposite-pole magnetic-attraction relationship to the second magnetic pole of the latch magnet positional intermediate the latch magnet and the reset magnet on an opposite side of the closure member;

the key magnet having magnetic force to overpower magnetic force of the reset magnet and transmit magnetic force through the closure member to actuate the pivotal latch to a pivotal position of disengageable relationship with the latch plate;

a closure hinge wall to which the closure member is attached pivotally;

a closure latch wall positioned at an opposite side of the closure member from the enclosure hinge wall;

a space block attached intermediately to the enclosure latch wall and the latch plate, said spacer block having a spacer surface; and,

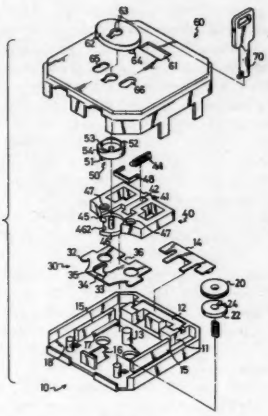
wherein the position inwardly in the compartment at which the spacer surface on the spacer block relative to the closure member in the locked position provides a disengagement air gap between an inside surface of the closure and the spacer surface on the spacer block, such that inward pivoting movement of the door permits the pivotal latch to disengage from locking relationship between the pivotal hatch and the latch plate.

5,485,734

COMBINATION LOCK

Kuo-Tsung Yang, No. 1, Alley 8, Lane 137, Fu Teh St., Taipei, Taiwan, Prov. of China

Filed Dec. 8, 1993, Ser. No. 164,003
Int. Cl.[6] E05B *37/00;65/48*
U.S. Cl. 70—285 **6 Claims**



1. A combination lock comprising:

a base equipped with at least one numerical wheel;

a cover engageable with the base;

a driving element operably mounted on the cover;

a sliding block slidably received within the base and cover and actuated by the driving element;

a control means being operably received on the sliding block and operable by a key to rotate a downwardly extending engaging element thereof to switch the combination lock between a key-openable mode and an a numerical-wheel-openable mode; and

a sliding plate slidably received between the base and the sliding block, the sliding plate having:

at least one ear to cooperate with the at least one numerical wheel and thereby selectively enabling a sliding movement of the sliding plate, and

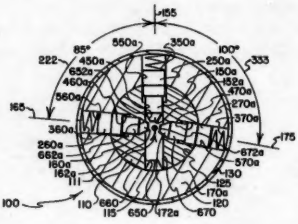
a guide portion adapted to cooperate with the engaging element and arranged such that the sliding block is confined to move with the sliding plate when the engaging element is in a first end of the guide portion and the sliding block is freely slidable relative to the sliding plate when the engaging element is in a second end of the guide portion.

5,485,735

KEY OPERATED ROTARY PLUG AND CYLINDER LOCK

Timothy P. Laabs, Des Plaines; Michael O. Misner, Lake Villa; Richard H. Schulz, Palatine, and Elbert M. Spencer, Wildwood, all of Ill., assignors to The Eastern Company, Wheeling, Ill.

Filed Dec. 6, 1993, Ser. No. 163,149
Int. Cl.[6] E05B *27/06*
U.S. Cl. 70—358 **49 Claims**



1. A key operated plug and cylinder lock comprising:

a) a cylinder having a plug-receiving hole formed therein;

b) a generally cylindrical plug configured to be journaled for smooth rotation within the plug-receiving hole of the cylinder, and defining a keyway of substantially rectangular cross-section that extends along a center axis of the plug;

c) pin-receiving holes formed in the cylinder and in the plug, and arranged in first, second and third rows that extend in first, second and third planes, with all of the pin-receiving holes of the first row extending in the first plane, with all of the pin-receiving holes of the second row extending in the second plane, with all of the pin-receiving holes of the third row extending in the third plane, and with all of the pin-receiving holes extending perpendicular to and intersecting the center axis of the plug;

d) tumbler pins carried within the pin-receiving holes, with the tumbler pins having inner end regions that are extensible into the keyway, and outer end regions that can be positioned to bridge junctures of the plug and the cylinder to prevent relative rotation of the plug and the cylinder, and that can be positioned to align with junctures of the plug and the cylinder to permit relative rotation of the plug and cylinder;

e) an elongate key of generally rectangular cross-section configured to be smoothly insertable into the keyway to bring recesses that are formed in two relatively flat, opposed side surfaces of the key, and in one narrow edge surface of the key into alignment with the pin-receiving holes so that the inner end regions of tumbler pins may be received within the recesses to position the tumbler pins to align with junctures of the plug and the cylinder to permit relative rotation of the plug and cylinder, with the recesses that are formed in at least one of the side surfaces of the key all being of generally oblong shape;

f) with the first plane extending from the center axis coaxially through the first row of pin-receiving holes, and paralleling the opposed, relatively flat side surfaces of the key when the key is inserted into the keyway, whereby the first row of tumbler pins is positioned to engage recesses that are formed in the narrow edge surface of the key; and,

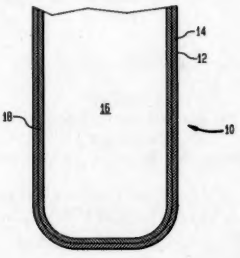
g) with the second and third planes extending in a non-aligned, non-coplanar manner from the center axis coaxially through the second and third rows of pin-receiving holes, respectively, with the second and third planes being inclined relative to the first plane at unequal first and second angles of inclination, respectively, with the first angle being chosen from a first set of angles that reside within a range of about 75 to about 105 degrees, with the second angle being chosen from a second set of angles that reside with a range of about 75 to about 105 degrees, with the angles that comprise the first set differing from each other by no less than about 5 degrees, with the angles that comprise the second set differing from each other by no less than about 5 degrees, and with at least one of the chosen first and second angles of inclination not being equal to either of 90 and 105 degrees.

5,485,736

SEAMLESS CYLINDER SHELL CONSTRUCTION

John P. Collier, Franklin Lakes, N.J.; Richard Hogle, Oceanside, Calif.; James G. Marsh, Amhurstburg, Canada, and Prakash Thomas, Poway, Calif., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 958,993, Oct. 9, 1992, Pat. No. 5,330,091. This application Mar. 22, 1994, Ser. No. 215,536
Int. Cl.[6] B21B *45/00;* **B21C** *23/24*
U.S. Cl. 72—47 **5 Claims**



1. A method of forming a seamless cylinder shell suitable for finishing into a gas cylinder comprising:

forming a composite sheet by electroplating a layer of nickel to a steel sheet so that said layer of nickel is uniformly bonded to said steel sheet and said composite sheet has two opposed, planar, major surfaces formed from, respectively, said layer of nickel and said steel sheet;

physically and chemically cleaning the two opposed surfaces of the composite sheet so that oil, soil, scale, oxide, and smut is removed from the composite;

pretreating the two opposed surfaces of the composite sheet to retain a lubricant and then, coating the two opposed surfaces of the composite with the lubricant;

heat treating said composite so that plating stresses are relieved; and

cold drawing the composite sheet into the seamless cylinder shell.

5,485,737

APPARATUS FOR HYDROFORMING A VEHICLE MANIFOLD

Devere C. Dickerson, Hamburg, Mich., assignor to Mascotech Tubular Products, Inc., Hamburg, Mich.

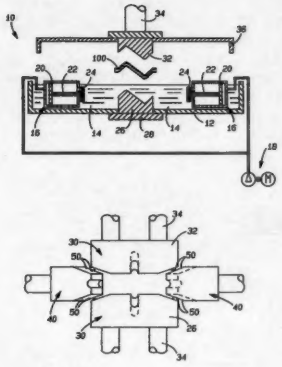
Division of Ser. No. 207,570, Mar. 7, 1994. This application Mar. 22, 1995, Ser. No. 408,742
Int. Cl.[6] B21D *9/15;15/03;26/02*
U.S. Cl. 72—57 **5 Claims**

1. An apparatus for manufacturing a tubular member of a vehicle manifold using hydroforming pressure to prevent deformation of said tubular member, said tubular member having a compound curvature for use in the manifold, the apparatus comprising:

a fluid bath formed by a pan having a predetermined volume of fluid therein;

a pair of hydraulically actuated cylinders disposed within said pan for sealingly retaining ends of a tubular blank, said cylinders including selectively extendable piston rods having seal plugs on the exterior ends of said piston rods for sealingly engaging the ends of said tubular blank;

means for increasing the internal fluid pressure within said tubular blank to a predetermined level;



a first die set disposed between said cylinders for stamping a curvature in said tubular blank along a first plane; and

a second die set disposed between said cylinders for stamping a curvature in said tubular blank along a second plane.

5,485,738

Patent Not Issued For This Number

5,485,739

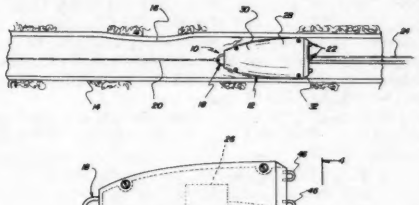
VIBRATING PIPE STRAIGHTENER

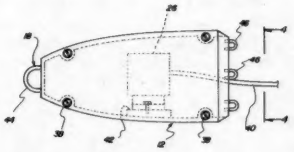
James G. Grimmett, 3027 16th Pl., Forest Grove, Oreg. 97116

Filed Feb. 24, 1995, Ser. No. 393,663

Int. Cl.[6] B21D *1/08*

U.S. Cl. 72—466 **9 Claims**





1. A vibrating pipe straightener comprising:

a tapered body positionable within a pipe having a dent, the tapered body being shaped so as to define a maximum outside diameter substantially equal to an inside diameter of the pipe;

a leading line mounting means secured to a front end of the tapered body for coupling to a leading line to facilitate pulling of the tapered body through an interior of the pipe;

a vibrator means mounted within the tapered body which cooperates with the tapered body for effecting vibrating impacting of the tapered body against the dent in the pipe to effect removal of the dent therefrom;

a trailing line mounting means for mounting to a trailing line which can be tensioned to pull the straightener from

wherein the tapered body comprises a cylindrical section; a tapered leading section extending forwardly of the cylindrical section and reducing in diameter so as to define a tapered leading edge which initially contacts a dent to be removed from a pipe; and a trailing section projecting from the cylindrical section of the tapered body in a direction opposite that of the tapered leading section.

5,485,740

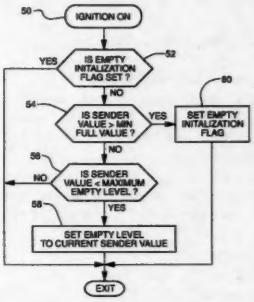
METHOD OF CALIBRATION FOR GAUGING FUEL IN AN AUTOMOTIVE TANK

Raymond Lippmann, Ann Arbor; Michael J. Schnars, Clarkston; James E. Nelson, North Branch; Ivan R. Brouwer, Swartz Creek, and Mahlon R. Pachciarz, Grand Blanc, all of Mich., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Dec. 2, 1994, Ser. No. 348,393

Int. Cl.[6] G01F *23/30*

U.S. Cl. 73—1 J **6 Claims**



1. In an automotive fuel level measurement system for a fuel tank having a fuel sender referenced to the bottom of the tank for sensing fuel level, a method of calibrating the fuel sender for an Empty value comprising the steps of:

initially storing a maximum empty value;

sampling the fuel level signal prior to fueling the tank when vehicle ignition is turned on;

comparing the fuel level signal to the maximum empty value; and

if the fuel level signal is less than the maximum empty value, storing the sampled fuel level signal as the Empty value.

5,485,741

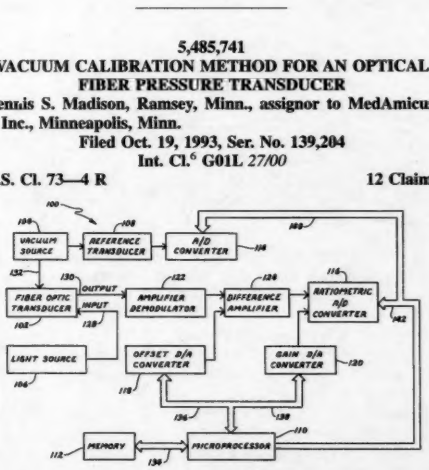
VACUUM CALIBRATION METHOD FOR AN OPTICAL FIBER PRESSURE TRANSDUCER

Dennis S. Madison, Ramsey, Minn., assignor to MedAmicus, Inc., Minneapolis, Minn.

Filed Oct. 19, 1993, Ser. No. 139,204

Int. Cl.[6] G01L *27/00*

U.S. Cl. 73—4 R **12 Claims**



1. A method for normalizing and calibrating a pressure measurement system of the type having an optical pathway for conducting

light to and from a pressure sensor comprising a pressure sensitive member that modulates the intensity of light returning from the pressure sensor in response to the sensed pressure, wherein the pressure sensor is connected in a calibration circuit including an offset and a gain, said method comprising:

initially normalizing the pressure measurement system transducer prior to calibration thereof by carrying out the steps of:

a. measuring the maximum light intensity returned from the pressure sensor;

b. measuring the minimum light intensity returned from the pressure sensor;

c. subtracting the minimum light intensity from the maximum light intensity to arrive at an intensity difference figure; and

d. adjusting the gain such that the intensity difference figure equals a predetermined constant and thereafter

calibrating the said pressure measurement system by the steps of:

a. transmitting light of known intensity along the optical pathway;

b. applying a pressure differential across the pressure sensitive member;

c. varying the pressure differential;

d. measuring the value of the pressure differential and the returning light intensity a preselected number of times;

e. storing the measured values of pressure and corresponding light intensity signals; and

f. applying a curve fitting formula over a discrete, predetermined range of light intensity signals to the stored values to arrive at a plurality of linear equations of the form y=mx+b, where

y=the pressure to be determined,

m=the slope of the line,

x=the modulated light signal, and

b=a constant,

each said equation applying to one of the said predetermined light intensity signals.

5,485,742

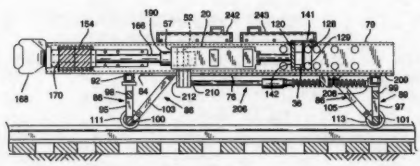
TEST SILL FOR RAILCAR CUSHION UNITS

Glen L. Litten, Springfield, Oreg., assignor to Emerald Hydraulics, Inc., Springfield, Oreg.

Filed Aug. 24, 1994, Ser. No. 296,316

Int. Cl.[6] G01M *17/00*

U.S. Cl. 73—11.06 **19 Claims**



1. An apparatus for supporting a railcar cushion unit during testing, said cushion unit having first and second ends and being movable between an expanded position and a compressed position, the apparatus comprising:

an elongated, horizontal sill member;

a coupler slider slidingly mounted to said sill member;

a coupler mounted on said coupler slider for coupling to a railcar cushion unit tester;

a stop block attached to the sill member for receiving a first end of said railcar cushion unit;

means for attaching a second end of said railcar cushion unit to said coupler slider; and

means for selectively attaching said stop block at any one of a plurality of stationary positions along said sill member.

5,485,743

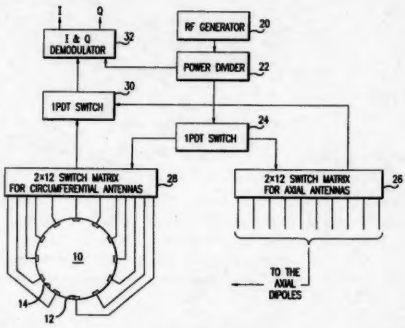
MICROWAVE DEVICE AND METHOD FOR MEASURING MULTIPHASE FLOWS

M. Reza Taherian, Ridgefield, and Tarek M. Habashy, Danbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 23, 1994, Ser. No. 311,080

Int. Cl.[6] G01N *22/00*

U.S. Cl. 73—61.44 **19 Claims**



1. A method for measuring multiphase flows in a conduit comprising using series of microwave antennae arranged around the conduit, each antenna being capable of transmitting microwave energy into the conduit and detecting propagated microwave energy in the conduit, transmitting microwave energy from each antenna in turn while detecting said microwave energy at the antennae which are not transmitting after propagation in the conduit so as to generate output signals; and integrating the output signals from all antennae so as to measure the flow in the conduit.

5,485,744

SULFURIC ACID CONCENTRATION SENSOR FOR LEAD STORAGE BATTERY

Tadamasa Akutagawa, 19-8, Kamiikedai 1-chome, Ota-ku, Tokyo 145, and Shigeru Sano, Takatsuki, both of, Japan, assignors to Tadamasa Akutagawa, Tokyo, and Yuasa Corporation, Osaka, both of, Japan

PCT No. PCT/JP92/01178, § 371 Date Mar. 15, 1994, § 102(e) Date Mar. 15, 1994, PCT Pub. No. WO93/06452, PCT Pub. Date Apr. 1, 1993

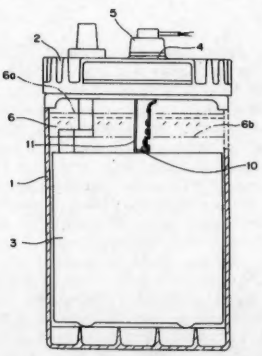
PCT Filed Sep. 16, 1992, Ser. No. 204,418

Claims priority, application Japan, Sep. 18, 1991, 3-237794

Int. Cl.[6] G01N *9/00*

U.S. Cl. 73—61.49 **10 Claims**

1. In a sensor for detecting a sulfuric acid concentration of



electrolyte for a lead storage battery, a sulfuric acid concentration sensor for the lead storage battery comprising:

a quartz resonator changing its characteristic frequency in an approximately linear relationship according to a change of sulfuric acid concentration, and an oscillation circuit coupled to and oscillating the quartz resonator, the quartz resonator being immersed in an electrolyte such that a characteristic frequency of the quartz resonator during oscillation is obtained so as to determine the sulfuric acid concentration;

wherein the quartz resonator further comprises:

electrodes installed on both surfaces of the quartz resonator plate respectively, each electrode being electrically coupled to the oscillation circuit, the quartz resonator plate being so installed that only one side surface of the plate contacts an electrolyte, and an electrode at the side contacting with the electrolyte being grounded through a condenser in respect of alternating current.

5,485,745

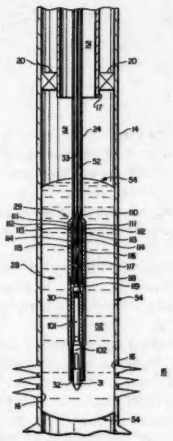
MODULAR DOWNHOLE INSPECTION SYSTEM FOR COILED TUBING

Robert A. Rademaker, The Colony; John J. Goiffon, Dallas; Michael L. Connell, Houston, and Walter K. Olszewski, Garland, all of Tex., assignors to Halliburton Company, Dallas, Tex.

Continuation-in-part of Ser. No. 703,287, May 20, 1991, abandoned. This application Sep. 1, 1992, Ser. No. 938,622

Int. Cl.[6] E21B *47/00*

U.S. Cl. 73—151 **27 Claims**



1. A method of using a downhole inspection tool to inspect the interior of a borehole comprising:

providing a cable head subassembly module attached to the lower end of a length of coiled tubing having an electrical/fiberoptic cable threaded therethrough, said module including means for terminating the electrical and optical conductors within said cable and for mechanical and electrical connection to an inspection module capable of producing an electrical signal indicative of downhole conditions;

connecting an injector feed through boot protector to said the mechanical terminating means of said cable head subassembly module, said protector receiving therein said electrical terminating means of said subassembly module;

inserting said boot protector, cable head subassembly module and coiled tubing attached thereto through a coiled tubing injector;

removing said boot protector from said cable head subassembly module;

attaching an inspection module to said cable head subassembly module to produce a downhole inspection tool; and

running said tool downhole to inspect downhole conditions.

5,485,746

HOT-WIRE TYPE AIRFLOW METER HAVING A FLOW SMOOTHING CARE

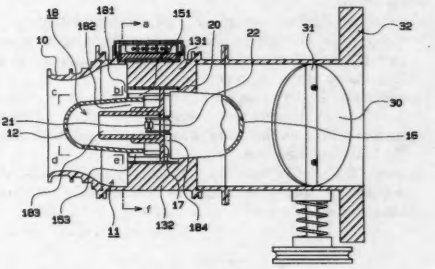
Yukio Mori, Nagoya; Noriyasu Kihara, Chiryu, and Takamitu Suzuki, Anjo, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 8, 1994, Ser. No. 286,249

Claims priority, application Japan, Aug. 10, 1993, 5-198355; Jan. 27, 1993, 5-268769

Int. Cl.[6] G01F *1/68*

U.S. Cl. 73—202 **15 Claims**



1. A hot wire type airflow meter comprising:

a housing defining a main passage through which air passes;

a central member supported in said main passage of said housing, including a flow smoothing core having a shape which has a closed proximal end at an upstream side and spreads out in a downstream direction for introducing air smoothly, and having an inlet portion for taking in a part of air flowing through said main passage and being disposed downstream of said flow smoothing core, a bypass passage communicating with said inlet portion, and an outlet portion for returning air passing through said bypass passage to said main passage; and

sensing means disposed in said bypass passage for measuring an airflow rate in said bypass passage;

wherein said bypass passage comprises an upstream side meander portion which has a meandering passage at an upstream side of said sensing means, a straight tube portion formed as a straight tube and accommodating said sensing means, and a downstream side passage communicating said straight tube portion with said outlet portion.

5,485,747

METHOD OF MEASUREMENT OF RELATIVE HUMIDITY, IN PARTICULAR IN RADIOSONDES, AND HUMIDITY DETECTORS THAT MAKE USE OF THE METHOD

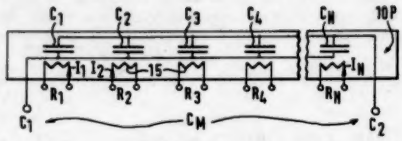
Veijo Antikainen; Ari Paukkunen; Lars Stormbom, all of Vantaa; Hannu Jauhiainen, Espoo, and Jorma Ponkala, Ylönkylä, all of, Finland, assignors to Vaisala Oy, Vantaa, Finland

Filed Aug. 23, 1994, Ser. No. 294,327

Claims priority, application Finland, Aug. 23, 1993, 933702

Int. Cl.[6] G01N *25/56;* G01W *1/00*

U.S. Cl. 73—335.03 **8 Claims**

1. Method for measurement of relative humidity by using a combination of detectors (10_1, 10_2, 10P) in each of which detectors, between the capacitor plates, an insulating material (12) is used, whose permittivity is a function of the amount of water vapor absorbed by said insulating material (12), and in which method

said combination of detectors is heated in order to remove any ice, frost, or condensed humidity deposited on the face or in the environment of the detector, each detector characterized by a number of component capacities (C_1 C_2 . . . C_N) which are connected so as to form a detector capacitance (C_M) to be measured and comprising the steps of:

periodically heating the detector capacitance (C_M) or a part (C_1 . . . C_N) of same, in time or in place, by means of electric current (I);

detecting the detector capacitance (C_M) without measurement of the detector temperature after the detector capacitance or a part (C_1 . . . C_N) of same as cooled down substantially to the temperature of the environment;

employing at least two separate detectors (10_1, 10_2) or a coupling of several component detectors (C_1 . . . C_N) in parallel;

heating each detector in its turn, when several separate detectors (10_1, 10_2) are used; and

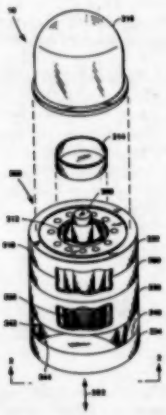
detecting the relative humidity substantially on the basis of a detector (10_1, 10_2) or its component detectors (C_1 . . . C_N) that has substantially cooled after said heating.

5,485,748

MAGNETICALLY LEVITATED FORCE/WEIGHT MEASUREMENT SYSTEM

Geoffrey H. Zeamer, 583 Winter St., Holliston, Mass. 01746

Filed Jan. 26, 1994, Ser. No. 187,626
Int. Cl.[6] G01P *15/00*
U.S. Cl. 73—862.61 **11 Claims**



1. A mass-levitating system, comprising:

a mass containing means for generating a first magnetic field, the mass being in a stationary levitated position during equilibrium of said system;

means for generating a second magnetic field, said second magnetic field generating means containing electric currents disposed in a manner that impinges on said .first magnetic field to produce a force needed to levitate the mass;

position detecting means for generating a signal indicative of a change in position of the mass; and

signal processing means for transforming said signal into alterations in said electric currents, so as to restore the mass to said stationary position in response to said signal;

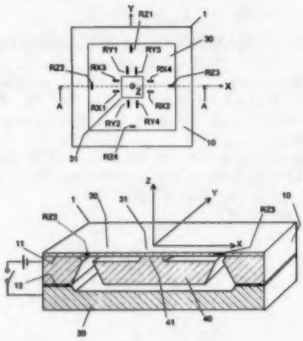
wherein operation of said means for generating a first magnetic field and said means for generating a second magnetic field obviates the need for cryogenic temperatures.

5,485,749

ACCELERATION DETECTOR

Kazuya Nohara, and Naohiro Taniguchi, both of Hirakata, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed May 18, 1994, Ser. No. 245,695
Claims priority, application Japan, May 26, 1993, 5-124361
Int. Cl.[6] G01P *21/00*
U.S. Cl. 73—517.34 **14 Claims**



1. An acceleration detector for independently detecting three-dimensional components of acceleration applied thereto with respect to X-, Y- and Z-axes of an orthogonal coordinate system, said acceleration detector comprising:

a frame defining an open space therein and having a top face and a bottom face, said frame being made of a semi-conductor material;

a thin-sheet resilient member made of the same semi-conductor material as said frame to extend in a plane over said open space and integrally joining at a periphery of said resilient member to the top face of said frame, said X- and Y-axes being defined to extend in the plane of said resilient member;

a weight made of the same semi-conductor material as said frame to depend from a center of said resilient member through a neck portion, said neck portion being fixed only with a center portion of said resilient member in such a manner that an elastic deformation of said resilient member will occur when said weight is displaced with respect to said frame by receiving said acceleration, said center portion being defined as a region of said resilient member corresponding to an interface between said resilient member and said neck portion;

a plurality of piezo resistance elements formed in said resilient member, the resistance of which varies in response to strain and elastic deformation of said resilient member, said resistance elements consisting of a first set of four resistance elements for detecting a first component of said acceleration with respect to said X-axis, a second set of four resistance elements for detecting a second component of said acceleration with respect to said Y-axis, and a third set of four resistance elements for detecting a third component of said acceleration with respect to said Z-axis, all of said resistance elements of said first and second sets being located within an inner area of said resilient member immediately adjacent to a circumference of said center portion such that one end of each of the resistance elements of the first and second sets reaches

the circumference of said center portion, said inner area being capable of a larger elastic deformation than an outer area of said resilient member adjacent to said frame when said weight is displaced by receiving an acceleration having a horizontal direction parallel to said plane of said resilient member; and

acceleration determining means for determining said acceleration in accordance with a variation of electric resistance of said resistance elements.

5,485,750

PROCESS FOR FINDING THE VALUE OF PARAMETERS CAPABLE OF CHANGING THE RESONANCE FREQUENCY OF MICROSTRUCTURES

Werner Schomburg, Karlsruhe, Germany, assignor to Kernforschungszenlrum Karlsruhe GmbH, Karlsruhe, Germany

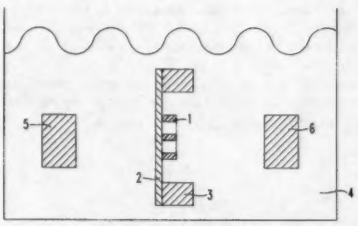
PCT No. PCT/DE92/00364, § 371 Date Sep. 8, 1993, § 102(e) Date Sep. 8, 1993, PCT Pub. No. WO92/19942, PCT Pub. Date Nov. 12, 1992

PCT Filed May 2, 1992, Ser. No. 117,092

Claims priority, application Germany, May 2, 1991, 41 14 268.3

Int. Cl.[6] G01H *13/00*

U.S. Cl. 73—579 **11 Claims**



1. A process for finding with a microstructure having a varying resonance frequency depending on a value of a parameter which changes the resonance frequency of said microstructure, wherein said microstructure includes at least one membrane having a periphery by which it is mounted on said microstructure and wherein at least one resonance frequency of the microstructure is between 100 kHz and 100 MHz, by

a) detecting the value of a characteristic resonance frequency of said microstructure wherein said microstructure is exposed to ultrasound which is transmitted through, or reflected from, said microstructure with a particular intensity and the intensity of the ultrasound transmitted through, or reflected from, said microstructure is determined, and

b) determining the value of said parameter by means of a calibration curve.

5,485,751

METHOD FOR LONGITUDINAL, TRANSVERSE AND OBLIQUE ERROR TESTING OF WORK PIECES BY MEANS OF ULTRASOUND, ACCORDING TO THE IMPULSE-ECHO METHOD

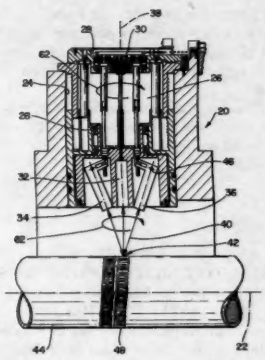
Bernhard Karbach, Erftstadt-Friesheim, and Ottokar Patzke, Erftstadt-Liblar, both of, Germany, assignors to Firma Krautkrämer GmbH & Co., Germany

Filed Jun. 23, 1993, Ser. No. 81,615

Int. Cl.[6] G01N *29/04*

U.S. Cl. 73—618 **12 Claims**

1. Method for longitudinal, transverse and oblique error testing of work pieces, by which a test head support (**26**) featuring at least one test head (**32** to **36**) is moved in a translatory direction along the surface of the work piece (**44**, **64**) and where ultrasound impulses are generated in a rapid sequence, which, coming from each test head (**32** to **36**) impact the surface of the work piece (**44**, **64**) along a sound beam in test areas on the surface of the work piece (**44**, **64**) whereby all of these test areas lie in a linear test path, so that in the case of uninterrupted, translatory movement, all test areas meet in one and the same test area, and whereby the sound beams progress in a given constant angle in relation to one set perpendicular line **38** on each test area, whereby a) the sound beams rotate, on a conical wall, around the respective perpendicular line, **38** forming an axis, b) complete rotation of 360° takes place in time t_r which is shorter than time t, which is required by the translatory movement in order to cross a distance with the dimensions of a test area, and c) per revolution generates and sounds at least ten ultrasound impulses into the surface of the work piece (**44**, **64**).



5,485,752

APPARATUS FOR DETECTING CONTACT WITH ROTATING BODY

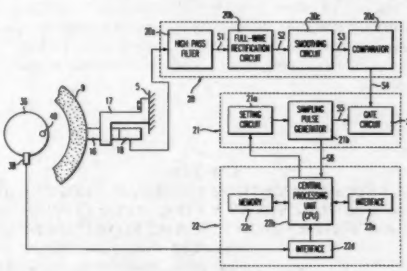
Hiroaki Asano, Okazaki; Yasuhiro Kobayashi, Anjo; Shigeo Hotta; Yoichi Yamakawa, both of Aichi; Akira Ito, and Hirotaka Sugiura, both of Kariya, all of, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 24, 1993, Ser. No. 125,752

Claims priority, application Japan, Sep. 25, 1992, 4-279231; Sep. 30, 1992, 4-261630; Sep. 30, 1992, 4-261631; May 31, 1993, 5-154241; May 31, 1993, 5-154242

Int. Cl.[6] G01M *7/00*

U.S. Cl. 73—660 **7 Claims**



1. An apparatus for detecting contact between a contact detection member and a rotating body, one of said contact detection member and said rotating body being moved toward an other of said contact detection member and said rotating body, comprising:

a sensor responsive to vibrations generated during a time period when said contact detection member is brought into contact with said rotating body for outputting an electric signal;

processing means responsive to said electric signal for processing said output to decide whether the detected contact has actually occurred or caused by disturbance,

wherein said processing means comprises:

a) a memory having addresses dedicated to different angular positions of a sampling interval of said rotating body and storing at said addresses data based upon a value of said output, and

b) decision means for deciding an occurrence of an actual contact between said rotating body and said contact detection member based on the values of data stored in said addresses of said memory.

5,485,753

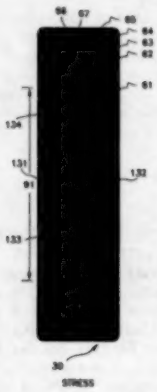
PIEZORESISTIVE SILICON PRESSURE SENSOR IMPLEMENTING LONG DIAPHRAGMS WITH LARGE ASPECT RATIOS

David W. Burns, Minneapolis, and Max C. Glenn, Shorewood, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 808,263, Dec. 13, 1991, abandoned. This application Oct. 28, 1993, Ser. No. 144,096

Int. Cl.[6] G01L *9/04*

U.S. Cl. 73—720 **15 Claims**



11. A multiple pressure sensor apparatus having a multiplicity of long rectangular diaphragm plates at least two of which are arranged so as to have their long edges in parallel and being of substantially the same dimensions as each other and each long rectangular plate having two linear sensing resistors each and being configured to provide a fully active wheatstone bridge configuration.

5,485,754

APPARATUS AND METHOD FOR MEASURING THE AIR FLOW COMPONENT AND WATER VAPOR COMPONENT OF AIR/WATER VAPOR STREAMS FLOWING UNDER VACUUM

Joseph W. Harpster, Galena, Ohio, assignor to Intek, Inc., Westerville, Ohio

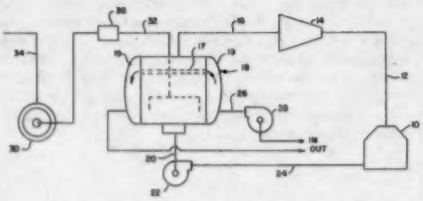
Filed Apr. 21, 1994, Ser. No. 230,974

Int. Cl.[6] G01F *1/74*

U.S. Cl. 73—861.04 **12 Claims**

1. Method for measuring the flow rate of the gas component and the mass density of water vapor component of a gas/water vapor source stream flowing in a conduit under reduced pressure, which comprises the steps of:

(a) storing a correlation of relative saturation of water vapor in said gas and the output electrical signal of a relative humidity sensor;



(b) storing a correlation of the flow rate of the gas component of a flowing gas/water vapor reference stream and the output electrical signal of a temperature-compensated flow sensor as a function of water vapor density;

(c) storing a correlation of maximum water vapor saturation in the gas as a function of temperature;

(d) generating an electrical signal of a temperature sensor in contact with said source stream;

(e) generating an output electrical signal of a relative humidity sensor in contact with said source stream;

(f) generating an output electrical signal of a temperature-compensated flow sensor in contact with said source stream;

(g) comparing said signal (e) with said stored correlation (a) to derive a relative saturation value which value is multiplied by the maximum water vapor saturation correlation (c) for the temperature determined from signal (d) in order to derive the mass density of the water vapor component of said source stream; and

(h) comparing said signal (f) with said stored correlation (b) at derived water vapor mass density (g) to derive the flow rate of the gas component of said source stream.

5,485,755

MASS FLOWMETER

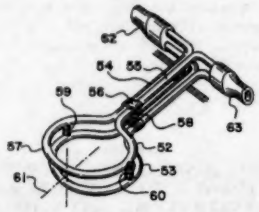
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Division of Ser. No. 14,802, Feb. 8, 1993, Pat. No. 5,337,616, which is a continuation-in-part of Ser. No. 693,929, Apr. 29, 1991, Pat. No. 5,241,865, and a continuation-in-part of Ser. No. 617,492, Nov. 21, 1990, abandoned. This application Jan. 5, 1994, Ser. No. 177,382

The portion of the term of this patent subsequent to Sep. 7, 2010, has been disclaimed.

Int. Cl.[6] G01F *1/84*

U.S. Cl. 73—861.38 **18 Claims**



1. An apparatus for measuring mass flow rate of media moving through at least one conduit under a flexural vibration, comprising in combination:

a) a conduit with two opposite extremities disposed in a relationship adjacent to one another and having a substantially zero spacing between the two opposite extremities of the conduit and secured to a common region of a supporting structure, said conduit including a curved midsection of a loop angle approximately equal to 360 degrees intermediate the two secured opposite extremities of the conduit, wherein center line of at least a central portion of the curved midsection of the conduit is disposed on a reference plane, said reference

plane being a plane defined by the center line of said at least a central portion of the curved midsection of the conduit;

b) means for exerting a vibratory force onto the conduit on a line of action perpendicular to the reference plane and lying on a center plane, said center plane being a plane perpendicularly intersecting with a central portion of the curved midsection of the conduit as well as with the reference plane and dividing the conduit into two substantially equal opposite halves; wherein the vibratory force generates a flexural vibration of the conduit in directions perpendicular to the reference plane; and

c) means for detecting difference in the flexural vibration of the conduit between two opposite halves of the conduit as a measure of mass flow rate of media moving through the conduit.

5,485,756

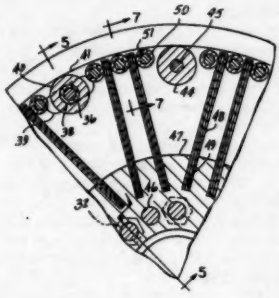
Patent Not Issued For This Number

5,485,757

ENGINE TORQUE SENSING ARRANGEMENT

W. John Foxwell, 2557 Lake Charnwood Blvd., Troy, Mich. 48098-2123

Filed Dec. 28, 1994, Ser. No. 365,415
Int. Cl.[6] G01L *3/10*
U.S. Cl. 73—862.321 **25 Claims**



1. A torque sensing arrangement for an engine transmission connection including an engine crankshaft and a torque converter housing, said torque sensing arrangement comprising:

a driving hub connected to said engine crankshaft to be rotated thereby;

a flex plate fixed to said driving hub;

a circumferential series of stop elements fixed to said torque converter housing and passing through respective arcuate slots in said flex plate, limiting relative rotation between said torque converter housing and said flex plate to a predetermined extent;

a series of radially extending blade springs fixedly anchored at their inner ends to a respective one of a series of slots in said driving hub;

a circumferential series of pairs of spaced elements fixed to a driving disc connected to said torque converter housing, each of said blade springs having a radially outward free end passing between pairs of said spaced elements to be captured therebetween; and

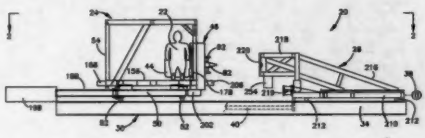
sensor means for detecting the extent of relative angular movement between said flex plate and said torque converter housing and generating signals corresponding thereto.

5,485,758

METHOD AND APPARATUS FOR SIMULATING VEHICLE SIDE IMPACTS

Louis R. Brown, Oxford; Charles E. Steffens, Jr., Washington; Charles E. Kroetsch, Troy, and Delmar H. Robbins, Rochester Hills, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Dec. 27, 1993, Ser. No. 174,884
Int. Cl.[6] G01N *3/30;17/00*
U.S. Cl. 73—865.8 **64 Claims**



1. An apparatus for use with a test dummy to simulate vehicle side impacts, said apparatus comprising:

a door structure for simulating a vehicle door;

a seat disposed adjacent to an inner side of said door structure for supporting the test dummy in a desired relationship with said door structure;

sled means for impacting against an outer side of said door structure to move said door structure relative to said seat; and

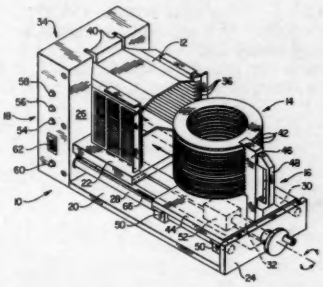
connector means for connecting said door structure with said sled means upon impacting of said sled means against said door structure.

5,485,759

BOAT TEST APPARATUS

Gerald L. Goff; Michael D. Smith, both of Austin, and Michael R. Conboy, Buda, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 28, 1994, Ser. No. 234,395
Int. Cl.[6] E01C *23/01*
U.S. Cl. 73—865.9 **8 Claims**



1. A boat test fixture, said boat having a plurality of slots for holding wafers, said boat test fixture comprising:

a base for fixedly holding said boat,

a wafer simulator, said wafer simulator having a plurality of wafers sized to properly seat in said plurality of slots in said boat;

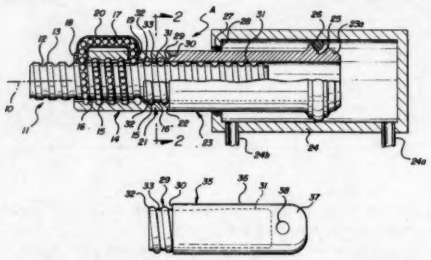
structure for moving said plurality of wafers of said wafer simulator wholly into and out of said plurality of slots in said boat; and

structure for determining whether said plurality of wafers is properly seated in said plurality of slots in said boat when said wafer simulator is moved wholly into said plurality of slots in said boat.

5,485,760
BALL NUT AND SCREW ASSEMBLIES AND METHODS OF ATTACHING EXTENSIONS OR HOUSINGS TO THE BALL NUTS THEREOF

David A. Lange, Bay City, Mich., assignor to Thomson Saginaw Ball Screw Company, Inc., Saginaw, Mich.

Filed May 10, 1994, Ser. No. 240,132
Int. Cl.[6] F16H *25/22*
U.S. Cl. 74—459 10 Claims

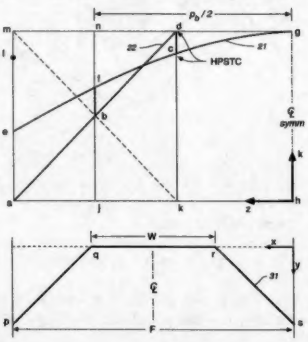


1. In a ball nut and screw assembly
(a) an axially extending screw having exterior helical ball carrying groove portions separated by land portions;
(b) a co-axial nut having complemental, helical interior ball carrying groove portions separated by land portions with the same lead as said screw groove and land portions;
(c) an end attachment for said nut having a reduced diameter sleeve extending axially therefrom;
(d) the sleeve having helical exterior thread portions, of the same lead as said nut groove portions, which are of a matching configuration and threaded into one end of said nut, the sleeve having an interior diameter which receives and passes said screw without interacting with it; and
(e) a recirculating train of load bearing balls accommodated within said nut and screw groove portions axially spaced from said sleeve.

5,485,761
ARTICULATED DIFFERENTIAL CROWNING

William S. Rouverol, Berkeley, Calif., assignor to Axicon Gear Company, Berkeley, Calif.

Continuation-in-part of Ser. No. 43,375, Apr. 6, 1993, Pat. No. 5,341,699. This application Aug. 1, 1994, Ser. No. 283,635
Int. Cl.[6] F16H *55/08*
U.S. Cl. 74—462 66 Claims

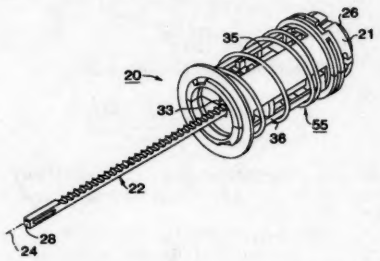


1. A pair of gears having mating teeth with a working surface on at least one of said pair that has a first crown at a first roll angle and a second crown at a second roll angle,
said second crown differing in form from said first crown,
said first crown including (a) a center segment having a length substantially shorter than the face width at said first roll angle, and (b) two outer segments that make an articulation angle with said center segment.

5,485,762
ADJUSTER TO ESTABLISH AND MAINTAIN RESIDUAL TENSION IN A CABLE SYSTEM

Josh L. Rothman, Huntington Beach, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Jun. 20, 1994, Ser. No. 263,510
Int. Cl.[6] F16C *1/22*
U.S. Cl. 74—501.5 R 5 Claims



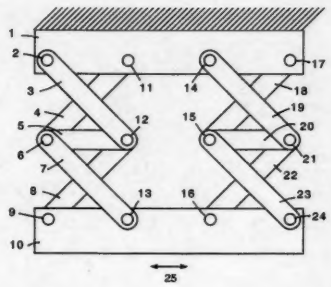
1. An adjuster for establishing and maintaining residual tension in a cable system comprising:
a reference body;
a ratchet member having a succession of ratchet teeth, each having a pass face and an abutment face;
a first and a second pawl member, each pawl member and having pawl teeth shaped to permit free passage of the ratchet teeth in the same one direction, and to engage them in the opposite direction;
flexible inelastic linkage means anchored to said body joining said pawl members to one another and when taut providing a multiplying effect whereby said first pawl member moves faster than the second pawl member relative to said body when said ratchet member is forced in a first direction relative to said body to increase the tension in said cable system;
a limit stop on said body limiting the movement of said second pawl in said first direction;
a pawl stop on said body limiting the movement of said second pawl member in the opposite second direction;
tensioning bias means mounted to said body and biasing said first pawl member to tend to draw said second pawl member toward said pawl stop; and
said reference body and said ratchet member being adapted for incorporation into a force system which includes at least one cable segment.

5,485,763
TAILORED MOTION LINKAGE

Cary Pincus, 1011 Aster Ave., Sunnyvale, Calif. 94086

Filed Sep. 26, 1994, Ser. No. 312,089
Int. Cl.[6] G05G *1/04*
U.S. Cl. 74—521 7 Claims

1. A linkage comprising a first pivot arm and a second pivot arm, crossed to each other, a first pivot point at one end of the first pivot arm and a second pivot point at the opposite end of the first pivot arm, a first pivot point at one end of the second pivot arm and a second pivot point at the opposite end of the second pivot arm, a third pivot arm and a fourth pivot arm, crossed to each other, a first pivot point at one end of the third pivot arm and a second pivot point at the opposite end of the third pivot arm, a first pivot point



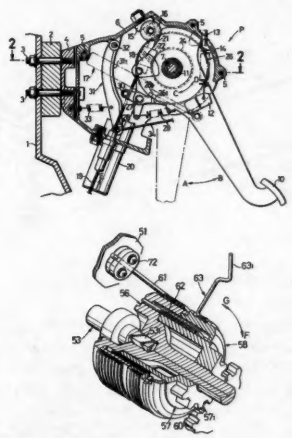
at one end of the fourth pivot arm and a second pivot point at the opposite end of the fourth pivot arm, a first means to maintain a fixed distance between the first pivot point of the first pivot arm and the first pivot point of the second pivot arm, a second means to maintain a fixed distance between the second pivot point of the first pivot arm and the second pivot point of the second pivot arm, said second means to maintain a fixed distance also used to maintain a fixed distance between the first pivot point of the third pivot arm and the first pivot point of the fourth pivot arm, and a third means to maintain a fixed distance between the second pivot point of the third pivot arm and the second pivot point of the fourth pivot arm.

5,485,764

PARKING BRAKE SYSTEM

Akinori Sugimoto; Atsushi Mori, and Kunio Nanno, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 261,918
Claims priority, application Japan, Jun. 16, 1993, 5-145199
Int. Cl.[6] B60T *7/12*
U.S. Cl. 74—535 **10 Claims**



1. A parking brake system for a vehicle comprising:

a brake operating member providing manual operation of the parking brake system;

a drive source for automatically operating the parking brake system; and

a unidirectional connecting member interconnecting said brake operating member and said drive source,

wherein said unidirectional connecting member permits transmission of power from said drive source to said brake operating member and prevents transmission of power from said brake operating member to said drive source,

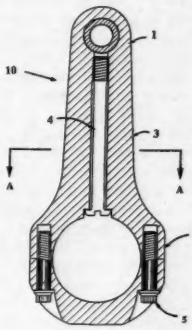
wherein said unidirectional connecting member is comprised of a first lock spring which is mounted between a drive roller connected to the drive source and a driven roller connected to the brake operating member to permit the relative rotation between both the rollers in one direction and wherein said parking brake system further includes a second lock spring for limiting the rotation of the drive roller in one direction, and a connection-releasing member for expanding the first lock spring to permit the rotation of the driven roller.

5,485,765

CONNECTING ROD WITH IMPROVED FATIGUE LIFE

Mohsen A. Khatiblou, 26522 Meadow Crest, Laguna Hills, Calif. 92653

Filed Jan. 19, 1994, Ser. No. 184,505
Int. Cl.[6] F02B *75/32*
U.S. Cl. 74—579 E **4 Claims**



1. A connecting rod for an engine having a wrist pin and a crankpin, said connecting rod comprising:

a beam member including a small end having a circular through hole for receiving the wrist pin of the engine, said beam member further including a large end having a circular through hole for receiving the crankpin of the engine;

an elongated bore centrally located within the beam member, said elongated bore extending from the circular through hole of the small end to the circular through hole of the large end, said elongated bore further including a threaded section adjacent the circular through hole of the small end;

a bolt having a threaded end and a rotational axis, wherein the threaded end is received in the threaded section of the elongated bore, and wherein the rotational axis extends through the center of the circular through hole of the small end and through the center of the circular through hole of the large end.

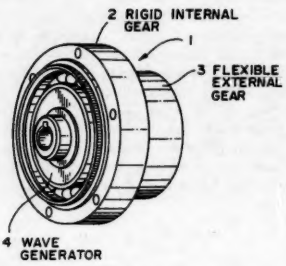
5,485,766

TERTIARY NEGATIVE-DEVIATION FLEXING CONTACT TYPE GEAR DRIVE OF NON-PROFILE-SHIFTED TOOTH PROFILE

Shoichi Ishikawa, Kanagawa, Japan, assignor to Harmonic Drive Systems, Inc., Tokyo, Japan

PCT No. PCT/JP92/01535, § 371 Date Sep. 14, 1994, § 102(e) Date Sep. 14, 1994, PCT Pub. No. WO94/12808, PCT Pub. Date Jun. 9, 1994
PCT Filed Nov. 24, 1992, Ser. No. 256,721
Int. Cl.[6] F16H *1/32*
U.S. Cl. 74—640 **3 Claims**

1. A tertiary negative-deviated flexing contact type gear drive having a rigid internal gear, a cup-shaped flexible external gear



disposed inside the internal gear, and a wave generator for flexing the external gear into an elliptical shape so that a deflection occurring in the external gear along a direction from a diaphragm to an opening thereof is proportional in value to a distance measured from the diaphragm, a relative rotation of the rigid internal gear and the flexible external gear being generated by a rotation of the wave generator; wherein both the rigid internal gear and the flexible external gear are made to be non-profile-shifted spur gears;

wherein the opening of the flexible external gear is set in a state of negative deviation wherein a deflection of the opening is lower in value than a normal deflection; a moving locus is obtained through a rack approximation of teeth of the external gear to the internal gear at respective sections of rotation of a tooth trace of the flexible external gear; an envelope is obtained by overlapping the moving locus on one of the sections of rotation; another moving locus is obtained in a section of rotation at an end portion of the tooth trace on a side of the diaphragm or in the vicinity of an outside of the end portion and is smoothly connected to the envelope to thereby obtain a composite curve; a curve is obtained by similarity transforming at a reduction ratio of ½ a portion from a starting point of the envelope to a terminating point thereof corresponding to two times a working depth in a direction of a depth from an apex of a moving locus when deviation is zero, using the terminating point as an original point; and the curve is made to be a main portion of a convex tooth profile for tooth faces of the rigid internal gear and the flexible external gear; and

wherein a second composite curve including a straight line having a limited pressure angle associated with a deflection value of the opening inserted in the vicinity of a datum point of a tooth profile and a transient curve smoothly connecting the straight line to the main portion of the convex tooth profile is made to be the tooth profile for the tooth faces of the rigid internal gear and the flexible external gear.

5,485,767

SAW BLADE MACHINING SYSTEM

Glynn A. Ellis, Suttonfields Dr., Sutton Bonnington, Loughborough, Leicestershire, United Kingdom

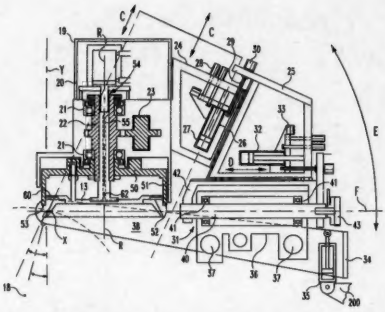
PCT No. PCT/GB92/00833, § 371 Date Jan. 4, 1994, § 102(e) Date Jan. 4, 1994, PCT Pub. No. WO92/19406, PCT Pub. Date Nov. 12, 1992

PCT Filed May 7, 1992, Ser. No. 146,146

Claims priority, application United Kingdom, May 7, 1991, 9109832

Int. Cl.[6] B23D *63/14*

U.S. Cl. 76—40 **20 Claims**



1. A machine for performing a plurality of machining operations on each tip of individual teeth of a saw blade comprising: a main frame having a pivot defining a first axis and having locating means for locating a saw blade coincident with a medial plane and so that each tip to be machined is positioned in turn at a machining point coincident with the first axis, a first yoke mounted on the pivot and situated substantially exclusively on a first side of a vertical plane containing the first axis, first machining means for machining at least one face of the tips supported on the first yoke, a second yoke mounted on the pivot and situated substantially exclusively on a second side of the vertical plane containing the first axis, second machining means for machining at least one other aspect of the saw blade supported on the second yoke, and means coupled to the yokes for independently moving the first and second machining means toward and away from the first axis to permit independent contact of selected portions of each tip by both the machining means while each tip is situated at said machining point.

5,485,768

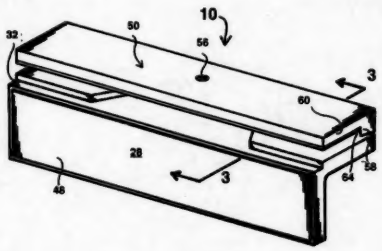
SKI SHARPENING GUIDE

James H. Vermillion, 14220 Orchard Ave., Caldwell, Id. 83605

Filed Oct. 13, 1994, Ser. No. 322,435

Int. Cl.[6] B23D *69/02*

U.S. Cl. 76—83 **8 Claims**



1. A ski sharpening guide to use with a file for sharpening edges of skis, the guide comprising:

an angular member comprising a substantially horizontal outer top surface having a front edge and an opposing rear edge and a substantially vertical outer side surface having an upper edge, the front edge of the top surface being connected to the upper edge of the side surface at a junction,

the angular member having a recess cut into the top surface extending from near the front edge to near the rear edge, the recess being defined by a bottom surface and first and second angled side walls, and the recess having an inlet near the front edge and an outlet near the rear edge, wherein the inlet is wider than the outlet,

wherein the top surface is for supporting the file, the side surface is for placement against and for moving against the ski, and the recess is for collecting filings that drop from the file and ski edge.

5,485,769

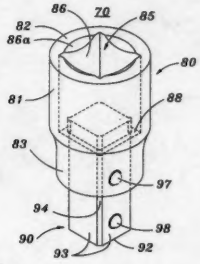
SQUARE DRIVE ADAPTER

Gene E. Olson, Kenosha, and Gerald A. Wridt, Racine, both of Wis., assignors to Snap-on Incorporated, Kenosha, Wis.

Continuation-in-part of Ser. No. 36,321, Mar. 24, 1993, Pat. No. 5,343,786. This application Aug. 3, 1994, Ser. No. 285,093

Int. Cl.[6] B25B *23/16*

U.S. Cl. 81—177.85 12 Claims



1. A polygonal drive adapter for transmitting torque between polygonal male and female drive elements of different size comprising: a unitary one-piece socket member having first and second ends and a longitudinal hole therethrough from end-to-end, said hole having a first polygonal portion of a first size adjacent to said first end for receiving an associated male polygonal drive element in mating engagement therewith and a second polygonal portion adjacent to said second end having the same cross-sectional shape as said first portion but of a second size different from said first size, a shoulder in said hole between said first and second portions facing said first end, and an elongated polygonal drive lug having an application end receivable in said second portion of said hole in mating engagement therewith and adapted for mating engagement with an associated female drive element and a coupling end, said drive lug having a plurality of flat planar sides joined by a plurality of corner portions, said drive lug including laterally extending retaining projections respectively formed at spaced-apart corner portions of said drive lug adjacent to said coupling end, said application end of said drive lug being insertable in and removable from said hole from said first end thereof with said projections engageable with said shoulder to limit the depth of insertion at a working position wherein said application end of said drive lug projects outwardly beyond said second end of said socket member.

5,485,770

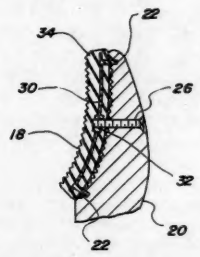
PLIER ENGAGING PAD ASSEMBLY

Douglas Popelak, 2610 Bonnaffon St., Philadelphia, Pa. 19142

Filed Mar. 22, 1995, Ser. No. 408,569

Int. Cl.[6] B25B *7/02*

U.S. Cl. 81—423 12 Claims



5. A plier engaging pad assembly comprising:

an engaging pad for securing to a first jaw of a pair of pliers;

a securing fastener threadably engaged to the pad which can be extended through a mounting aperture in the first jaw of the pliers to secure the engaging pad thereto;

wherein the engaging pad comprises a flexible interior strip; a threaded receiving boss positioned in a center of the flexible interior strip and threadably engaging exterior threads of the securing fastener; and a polymeric casing encapsulating the flexible interior strip.

5,485,771

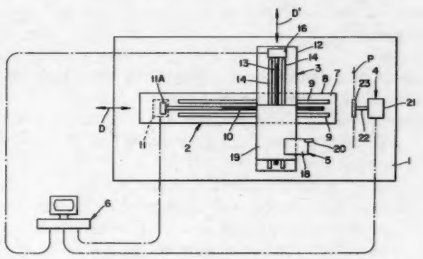
APPARATUS FOR GENERATING OPHTHALMIC PRODUCTS FROM BLANKS AND A METHOD OF OPERATING SAME

William D. Brennan, Muskogee, Okla.; Stephen Kulan, Highland, Ind.; Ronald T. Hyslop, Tulsa, Okla.; Johnny Ellis, Broken Arrow, Okla.; Ray Gregory, Muskogee, Okla.; Larry Penner, Wagoner, Okla., and James K. Hays, Okmulgee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Continuation-in-part of Ser. No. 11,835, Feb. 2, 1993, abandoned, which is a continuation of Ser. No. 766,394, Sep. 27, 1991, abandoned. This application Mar. 19, 1993, Ser. No. 38,350

Int. Cl.[6] B23B *5/00*

U.S. Cl. 82—1.11 21 Claims



1. A method of operating an apparatus for generating ophthalmic products from blanks, comprising the steps of:

rotating a blank about an axis of rotation, said blank having a surface through which said axis extends;

effecting relative movement between said cutter tool and the blank in a first direction oriented parallel to said axis of rotation of the blank for cutting a desired configuration onto said surface of the blank;

effecting relative movement between said cutter tool and the blank in a second direction oriented transverse to said first direction; and

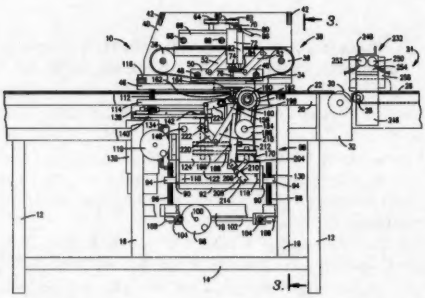
supplying signals from a digital electronic means for controlling the angular displacement of the blank with respect to a reference plane containing the blank and for controlling the relative movement between the cutter tool and the blank in said first and second directions, whereby the relative movements between said cutter tool and said blank in said first and second directions and the angular displacement of the blank about said axis of rotation are all proactively controlled independently of one another without any one of said relative movements and said angular displacement being dependent on a different movement or angular displacement of the cutter tool or the blank, by means of control signals supplied at regular time intervals.

5,485,772

BUN SLICING MACHINE

Paul M. Bastasch, Overland Park, Kans.; Randyl C. Hanson, Lake Lotawana; Laclede L. Hill, Kansas City, both of Mo.; William E. Norton, Edwardsville, Kans., and Hans W. Schoenbuchner, Conygham, Pa., assignors to United Bakery Equipment Company, Lenexa, Kans.

Filed Feb. 23, 1994, Ser. No. 200,435
Int. Cl.[6] B26D *3/08*
U.S. Cl. 83—873 5 Claims



1. A machine for slicing buns arranged in clusters each having a bottom and a pair of outside buns and at least two interior buns connected with each other at a weakened area, said machine comprising:

a frame;

means on said frame for conveying the clusters of buns successively along a predetermined conveyor path;

outside sluicing means mounted on said frame for effecting generally horizontal slices in the outside buns of each cluster conveyed along said path;

a disk having a dull peripheral edge portion;

means for mounting said disk on the frame for rotation about a generally horizontal axis at a location beneath said path wherein each cluster conveyed past the disk is engaged by said edge portion from the bottom near said weakened area;

said mounting means including a linkage mounting said disk on the frame for movement between an operating position wherein the disk is situated to effect said break and a disengaged position wherein said disk is withdrawn below the conveyor path and does not affect the buns conveyed thereon; and an operating lever in said linkage for selectively moving the disk between the operating and disengaged positions;

means for driving said disk about said axis to effect a break along said weakened area of each cluster extending from the bottom thereof and terminating below the top of the cluster;

a slicing blade;

a shaft on which said slicing blade is mounted, said shaft being supported on the frame for rotation downstream from said disk at a location to extend into said break to situate said blade in position to effect generally horizontal slices in the interior buns of each cluster conveyed along said path;

means for rotating said shaft to rotate said slicing blade;

a drive element for holding said shaft and transmitting rotational power thereto;

releasable means for securing said shaft to the drive element; and

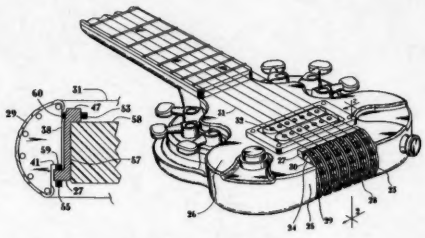
means for automatically releasing said releasable means when the disk is moved to the disengaged position, thereby allowing said shaft to be removed from said drive element.

5,485,773

GUITAR STRING INSTALLATION AND ADJUSTMENT MECHANISM

Terry J. Devitrysmith, 17005 NE. 101st Pl., Redmond, Wash. 98052

Filed Feb. 6, 1995, Ser. No. 386,523
Int. Cl.[6] G10D *1/08*
U.S. Cl. 84—267 2 Claims



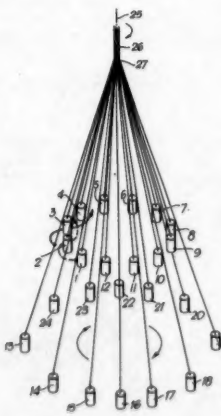
1. Guitar string installation and adjustment apparatus for installation and use on a guitar having a body and at least one electronic pickup, said at least one string having an effective length and being a distance from said pick up, said body having a front, a back, first and second sides and a top and a bottom, said mechanism comprising a carrier assembly, said assembly being installed on said bottom and carrying said at least one string from said front to said back around said bottom, said assembly further comprising means for adjusting said effective length of said string and said distance.

5,485,774

TEXTILE BRAIDS FOR CABLES, FLEXIBLE TUBES AND THE LIKE

Robert Osborne, Brockville, Canada, assignor to Phillips Cables Limited, Ontario, Canada

Filed May 23, 1994, Ser. No. 247,260
Claims priority, application United Kingdom, Jul. 31, 1993, 9315910
Int. Cl.[6] D04C *1/00*
U.S. Cl. 87—6 8 Claims



1. A tubular textile braid comprising first and second sets of yarns each yarn made up of a plurality of synthetic monofilaments, the yarns of said first set all extending in one direction around the axis of the braid and the yarns of said second set in the opposite direction, all the yarns of said first set having equal twists and all the yarns of said second set having equal twists but the yarns of said first and second set differing in twist to an extent such that the

yarns of said second set have their tensile strength increased by at least 10% but do not have their cover in the braid decreased by more than 25%, both by comparison with an otherwise identical yarn having the same twist as that of said first set.

5,485,775

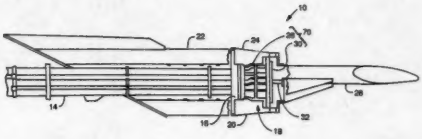
GUN GAS CONTROL SYSTEM FOR MULTI-BARREL WEAPONS

Steven R. Duke, Williston; Glenn E. Rossier, Ferrisburg, and Richard P. Saganich, Cambridge, all of Vt., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 16, 1994, Ser. No. 357,699

Int. Cl.[6] F41A *21/36*

U.S. Cl. 89—14.3 **5 Claims**



1. A gun gas control system for use on a multi-barrel gatling type gun, said gun gas control system providing torque to rotate the barrels, a recoil counter force, and venting of muzzle gas to a desired location, said gun gas control system comprising:

a gas diverter assembly, said gas diverter assembly connected to a muzzle clamp for holding said barrels of said gatling type gun, said gas diverter assembly providing rotation torque to said barrels and directing muzzle gas in desired directions, said gas diverter assembly comprising:

a gas diverter, said diverter connected to said muzzle clamp, said gas diverter changing the muzzle gas from an axially flowing direction to a radial and tangential directions:

a baffle plate, said baffle plate connected to a front of said gas diverter, said baffle plate restricting the forward flow of muzzle gas, said baffle plate having an exit hole for each barrel of said Gatling type gun; and

a blocking plate assembly, said blocking plate assembly being positioned within said gas diverter and said baffle plate, said blocking plate assembly preventing a flow of muzzle gas into non-firing gun barrels of said Gatling type gun, said blocking plate assembly not rotating with said barrels;

means for collecting and routing said muzzle gas from said diverter assembly to said desired locations.

5,485,776

MECHANISM FOR CONTROLLING THE FIRING RATE OF AN AUTOMATIC WEAPON

George Ealovega, Haslemere, Great Britain, assignor to Bushman Limited, United Kingdom

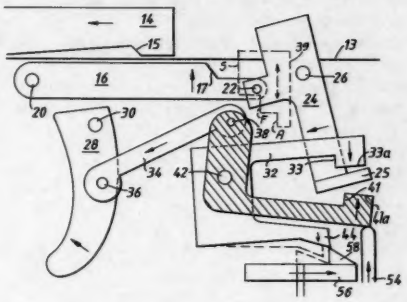
Continuation of Ser. No. 75,334, Jun. 11, 1993, abandoned, which is a continuation of Ser. No. 752,609, Oct. 16, 1991, abandoned. This application Oct. 13, 1994, Ser. No. 322,365

Claims priority, application United Kingdom, Dec. 16, 1989, 8928452

Int. Cl.[6] F41A *19/04*

U.S. Cl. 89—130 **15 Claims**

1. A trigger mechanism for a gun having an ammunition discharge means a main sear lever for controlling movement of the ammunition discharge means, means for actuating the main sear lever, and an arm carded by the means for actuating the main sear lever, and the gun being capable of full), automatic firing, said trigger mechanism comprising a physically displaceable trigger, an arrest means including a cam element and a pair of sears each having a sear face for cooperation with the arm, and a timing device having a complementary cam element, said arrest means operable to interrupt said ammunition discharge means of said gun,



wherein said cam element of said arrest means cooperates with said complementary cam element of said timing device, and wherein said timing device comprises an electric motor operable to drive said complementary cam element when said physically displaceable trigger is moved to a firing position to enable fully automatic firing of said gun, said timing device being operable to effect cyclical release of said ammunition discharge means by said arrest means.

5,485,777

ABRASION PREVENTING DEVICE FOR HERMETIC RECIPROCATING COMPRESSOR

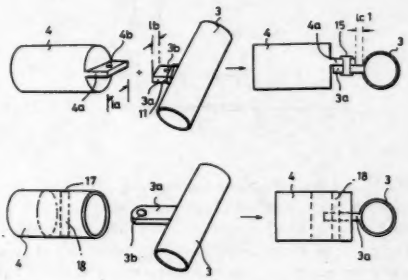
Dong-Hyeon Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea

Filed Sep. 20, 1994, Ser. No. 309,399

Claims priority, application Rep. of Korea, Sep. 21, 1993, 19084/1993

Int. Cl.[6] F16J *1/10*

U.S. Cl. 92—84 **7 Claims**



1. An abrasion preventing device for a hermetic reciprocating compressor comprising:

a cylinder;

a piston received and reciprocating in the cylinder, an end of said piston having a coupling projection;

a shell coupled to said piston, said shell having a coupling projection;

means for coupling the piston to the shell by coupling the projections of both the piston and the shell to each other; and elastic means provided on a coupling portion between the piston and the shell for absorbing an impact moment caused by striking of a slider on the shell during an operation of the compressor.

6. An abrasion preventing device for a hermetic reciprocating compressor comprising:

a cylinder;

a piston received and reciprocating in the cylinder, said piston being axially partially hollowed and having diametrically

opposed radial through holes formed on the side wall of a hollowed section of the piston;

a shell coupled to said piston, said shell having a coupling projection; and

means for coupling the piston to the shell by coupling the projection of the shell to said through holes of the piston.

5,485,778

BEVERAGE BREWING APPARATUS

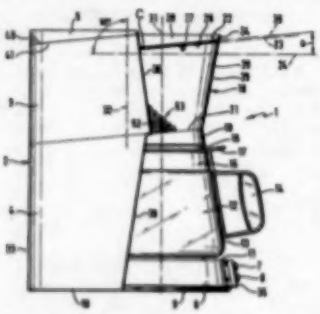
Roland Uhmann, Offenbach, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany

Filed May 31, 1994, Ser. No. 251,504

Claims priority, application Germany, Jun. 1, 1993, 4318113.9

Int. Cl.[6] A47J *31/24*

U.S. Cl. 99—295 **9 Claims**



1. A beverage brewing apparatus comprising

a brewer housing including a cover assembly;

a filter assembly which is removable from the brewer housing along a plane of movement, said filter assembly having an upper rim which forms an opening on top, wherein the filter assembly is adapted to receive ingredients such as ground coffee beans or tea leaves for preparing a brew, wherein the opening of the filter assembly is located under the cover assembly when the filter assembly is fully inserted into the brewer housing, wherein the cover assembly has an underside in which there is a discharge port from which a brewing water flows through the opening into the filter assembly and thereafter into a vessel placed under the filter assembly, wherein a predominant portion of the upper rim of the filter assembly lies in a first plane, wherein an area of the underside of the cover assembly cooperates with the predominant portion of the upper rim and lies in a second plane, wherein, with the filter assembly fully inserted into the brewer housing, the first and the second planes are vertically disposed in close proximity to each other, extend essentially parallel to each other, and are inclined relative to the plane of movement by an angle of inclination (a).

5,485,779

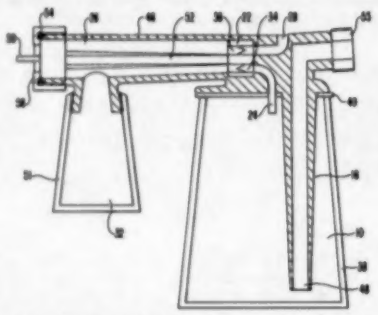
DEVICE FOR SELECTIVELY PRESSURIZING OR EVACUATING A CHAMBER WITH AN OSCILLATING AIR SOURCE BY METERING AIR THROUGH A VALVE SYSTEM AND A DEVICE FOR DRAWING INTO, RETAINING AND EVACUATING MATERIAL FROM A CHAMBER

John P. Evans, 7814 Marion La., Bethesda, Md. 20814, and Robert H. Evans, P.O. Box 191, Angelica, N.Y. 14709

Continuation-in-part of Ser. No. 87,533, Jul. 8, 1993, Pat. No. 5,394,789. This application Mar. 6, 1995, Ser. No. 398,682

Int. Cl.[6] A47J *37/10;43/28*

U.S. Cl. 99—345 **24 Claims**



1. A device for selectively imbibing or expelling materials from a chamber comprising:

a chamber;

a conduit, for collecting or expelling materials, having a distal end exposed to the environment and a proximal end within said chamber;

a valve assembly including a first one-way valve and an oppositely oriented second valve;

a first air passageway coupling said chamber with a first side of the valve assembly;

a second air passageway coupled to a second side of the valve assembly;

an oscillating air source coupled to said second air passageway;

a third air passageway coupled with the first side of said valve assembly.

5,485,780

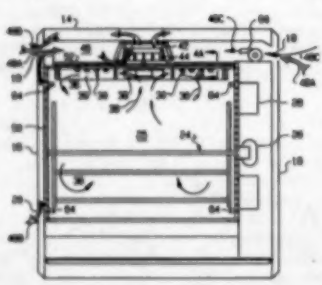
ROTISSERIE OVEN

Bernard Koether, Tequesta, Fla.; George F. Koether, II, Bridgeport, Conn., and Harald Ubert, Raesfeld, Germany, assignors to Food Automation Service Techniques, Inc., Stratford, Conn.

Filed Feb. 26, 1993, Ser. No. 23,949

Int. Cl.[6] A47J *37/04*

U.S. Cl. 99—419 **14 Claims**



7. An oven, comprising:

a cooking chamber for receiving food products to be cooked, defined by at least side walls and top and bottom walls;

an outer casing surrounding said cooking chamber and spaced away from said chamber to define circulation passages between the chamber side and top walls and the casing;

first air flow passage disposed within the cooking chamber and defined by said top wall and a cover secured thereto;

first fan means disposed within said first passage for drawing air therethrough and circulating air within the cooking chamber;

first heating means disposed in said first passage for heating air passing therethrough;

second air flow passage disposed above the cooking chamber communicating with the outside of the casing and said circulation passages;

second fan means disposed within said second passage for drawing air therein and circulating air through said circulation passages;

first fan motor disposed in said second airflow passage for driving both said first and second fans means;

third fan means including a motor separately controllable from said first and second fan means, said third fan means being disposed to direct outside air into the second air flow passage for cooling said first fan motor and the oven casing without creating convection currents in the cooking chamber;

radiant heating means mounted inside the cooking chamber, but outside the first flow passage;

operator interface means for allowing an operator to select between a plurality of operational modes, said modes including

a) convection only mode wherein said first heating means and said first fan motor and first and second fan means are activated,

b) radiant only mode wherein said radiant heating means and third fan means are activated, and

c) combination mode wherein said first and second fans means, said first heating means and said radiant heating means are activated; and

control means responsive to said interface means for activating and controlling each said heating and fan component in accordance with the operator selected modes.

5,485,781

APPARATUS AND METHOD FOR SCREEN PRINTING A RIGID OBJECT WITH CLEANING OF THE PRINT SIDE OF THE FRAME

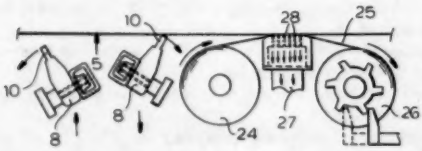
Lorenzo Rovaris, Monza, Italy, assignor to Asco Screen Products S.r.l., Milan, Italy

Filed May 26, 1994, Ser. No. 249,804

Claims priority, application Italy, May 28, 1993, MI93A1113

Int. Cl.[6] B41F *15/12;35/00*

U.S. Cl. 101—129 **7 Claims**



1. An apparatus for screen printing a glass pane, comprising:

a printing bed provided with means for holding a glass pane to be screen printed;

a printing frame disposed above said printing bed and provided with a design for screen printing on said glass pane, said design extending beyond a perimeter of said glass pane;

means for distributing ink on said printing frame;

first scraping means above said printing frame for scraping said ink over said design and forcing said ink through said design to screen print said glass pane;

second scraping means below said frame and including at least one scraper movable in two directions for scraping ink from a lower face of said printing frame in regions beyond said perimeter;

ink removing means at said printing frame engaging with said at least one scraper for removing ink therefrom scraped by said at least one scraper off of said lower face of said frame; and

wiping means for wiping said lower face with absorbent paper subsequent to removal of ink therefrom by said at least one scraper.

5,485,782

APPARATUS FOR PRINTING PROOFS

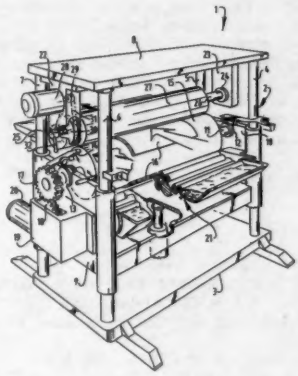
Hans Van Der Horst, Rijnsaterwoude, Netherlands, assignor to AV Flexologic B.V., Alphen A/D Rijn, Netherlands

Filed Mar. 13, 1995, Ser. No. 402,178

Claims priority, application Netherlands, Mar. 14, 1994, 9400397

Int. Cl.[6] B41F *5/00*

U.S. Cl. 101—216 **9 Claims**



1. Apparatus for printing onto a substrate printing plates manufactured from flexible material, comprising:

a frame;

a forme cylinder mounted in the frame and adapted to receive the printing plate;

a counter-pressure cylinder mounted in the frame;

guide means for carrying the substrate for printing between the forme cylinder and the counter-pressure cylinder;

drive means for driving the forme cylinder and the counter-pressure cylinder,

characterized in that the drive means are adapted to drive the forme cylinder and the counter-pressure cylinder at a different peripheral speed.

5,485,783

APPARATUS FOR FASTENING A FLEXIBLE PRINTING PLATE

Gunnar Rau, Königsbrunn; Karl-Heinz Müller, Gersthofen, and Heinrich Schmid, Kutzenhausen, all of, Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach, Germany

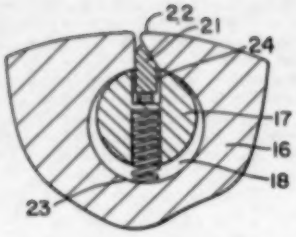
Filed Jun. 9, 1994, Ser. No. 257,343

Claims priority, application Germany, Jun. 9, 1993, 43 19 167.3

Int. Cl.[6] B41F *27/06*

U.S. Cl. 101—378 **10 Claims**

1. An apparatus for fastening a flexible print plate having a width on a printing cylinder of a printing machine, the printing



cylinder having a shell with an axially extending groove having a groove wall that is at an angle to an outer surface of the cylinder shell and a groove wall approximately perpendicular to the outer surface of the cylinder shell, the apparatus comprising: a tie beam disposed in the cylinder groove; means for elastically supporting the tie beam against the bottom of the cylinder groove; a clamping body having clamping surfaces that conform to the groove walls, one of the clamping surfaces being approximately perpendicular to the outer surface of the cylinder shell, the clamping body being accommodated in the tie beam so as to be movable in a clamping direction and so that each of the clamping surfaces cooperates with a separate one of the groove walls to engage a separate end of the printing plate therebetween, the tie beam and the clamping body being adapted to extend at least over the width of the printing plate; means for elastically supporting the clamping body in the tie beam so that the clamping body can be extended to a stop, the tie beam being arranged to extend approximately to the end of the cylinder shell; and activating means for acting on the beam so that forces are directed radially on the printing cylinder.

5,485,784

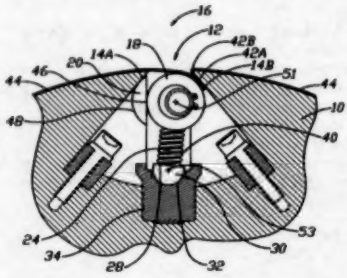
PRINTING PLATE CYLINDER WITH UNIVERSAL LOCKUP APPARATUS

Alan R. Walschlaeger, Sr., 1334 S. Hamilton, Elmhurst, Ill. 60126

Filed Jun. 28, 1994, Ser. No. 267,859

Int. Cl.[6] B41F *1/28*

U.S. Cl. 101—415.1 **20 Claims**



1. In a printing plate cylinder having an elongate mounting slot with a pair of opposite walls, the improvement being a universal lockup apparatus for releasibly holding opposed edges of a printing plate within the mounting slot, comprising:

a member for clamping at least one of the opposed edges of the plate against one of the opposed walls of the slot;

a brace member;

means for mounting the brace member for movement between one operative position in which it is interposed between one of the pair of opposite walls of the slot and the clamping member to brace the clamping member against movement away from the other one of the pair of opposite walls to another operative position in which the brace member is interposed between the other one of the pair of opposite walls of the slot and the clamping member to brace the clamping member against movement away from the one of the pair of opposite walls.

5,485,785

PROCESS AND DEVICE FOR ADJUSTING THE CONTACT PRESSURE OF A SYNTHETIC-BLANKET ROLLER IN ROTARY PRINTING PRESSES

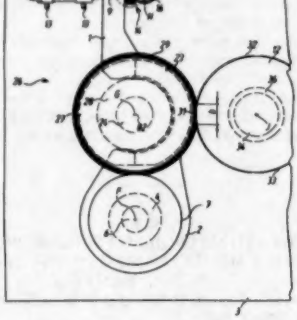
Georg Schneider, Würzburg, and Ewald Röthlein, Retzstadt, both of, Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Mar. 23, 1995, Ser. No. 403,849

Claims priority, application Germany, Sep. 25, 1992, 42 32 163.8

Int. Cl.[6] B41F *23/04*

U.S. Cl. 101—487 **8 Claims**



1. A process for maintaining a set contact pressure per defined width of a roller mark of an ink application roller provided with a resilient covering against a printing cylinder of a rotary printing press during temperature changes of the printing cylinder including the steps of:

supporting said ink application roller in a lever arm having an upper end and a lower end;

connecting said lever arm to a frame of said press for pivotal movement;

providing an adjustable stop on said frame;

using said adjustable stop to shift said lever arm to define said roller mark;

utilizing means to bias said lever arm against said adjustable stop;

interposing a temperature compensating element between said lever arm and said adjustable stop; and

using said temperature compensating element to automatically shift said ink application roller with respect to said printing cylinder in response to heating changes of said ink application roller.

5,485,786

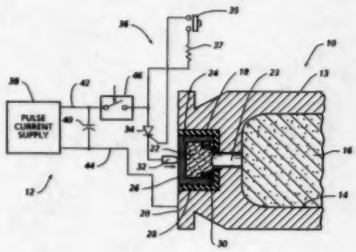
ELECTRONIC PRIMER IGNITION SYSTEM

Philip W. Hesse, Ellicott City; Raymond Goetz, Baltimore, and Daniel Lenko, Monrovie, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 151,695, Nov. 15, 1993. This application May 2, 1995, Ser. No. 433,858

Int. Cl.[6] F41A *19/58;* F42B *5/08*

U.S. Cl. 102—202.5 11 Claims



1. In combination with a cartridge case within which a primer mixture is retained by a retention cap and means for ignition of the primer mixture including a firing pin and triggering circuit means for transmission of electrical ignition current to the firing pin and a voltage supply battery, the improvement residing in: converter means connecting the battery to the triggering circuit means for supply thereto of uniform pulsating voltage from which the ignition current is derived and voltage charging means connected to the battery for prolonging said supply of the uniform voltage to the triggering circuit means to continue said transmission of the electrical ignition current to the firing pin following displacement thereof into contact with the retention cap.

5,485,787

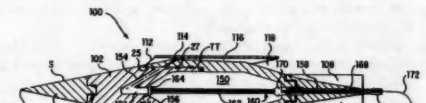
GAS GUN LAUNCHED SCRAMJET TEST PROJECTILE

Kevin G. Bowcutt, Irvine, and Harry Shortland, Torrance, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jun. 21, 1994, Ser. No. 264,207

Int. Cl.[6] F42B *15/00;* F02K *7/10*

U.S. Cl. 102—374 4 Claims



1. A gas gun-launched, propulsion-assisted scramjet projectile adapted to be fired from a gun at velocities greater than Mach 5, comprising:

a body, including an external compression section, an internal compression section, a combustion section, and a nozzle section,

a sabot assembly releasable secured about the rear end portion of said body,

means for providing fuel at said combustion section,

means, coupled with said sabot assembly, for initiating operation of said fuel providing means when said sabot separates from said projectile as it exits from the barrel of the gun, and means for channeling ambient fluid to an engine in one of the sections of the body,

said channeling means and said body cooperating with the engine to produce thrust greater than drag when said projectile travels at velocities greater than Mach 5.

5,485,788

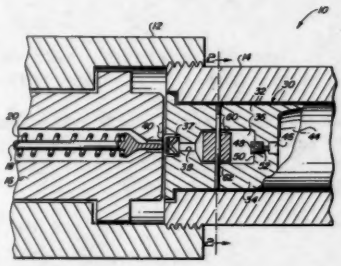
COMBINATION EXPLOSIVE PRIMER AND ELECTRO-EXPLOSIVE DEVICE

Martin Corney, Glendora, Calif., assignor to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Sep. 27, 1994, Ser. No. 313,625

Int. Cl.[6] F42B *5/08*

U.S. Cl. 102—472 26 Claims



1. A combined explosive primer and electro-explosive device comprising:

a firearm cartridge having an explosion chamber adjacent a base portion and an electric detonator positioned to detonate a quantity of explosive material to be detonated in said chamber;

a piezoelectric crystal mounted within an expansion chamber in said base portion in a position to be impacted by the movement of an inertial element which is also mounted within said expansion chamber, said inertial element having a forward end facing the detonator and a rear end remote therefrom, the forward end terminating in a forward wall;

electric circuit leads for electrically coupling the piezoelectric crystal to the electric detonator; and

means including an explosive primer for driving said inertial element to a point of impact of the piezoelectric crystal in order to fire said cartridge.

5,485,789

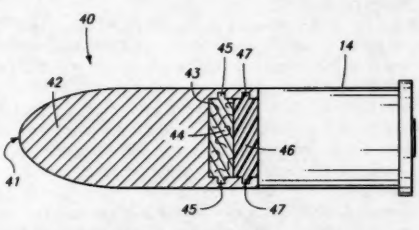
BULLET IDENTIFICATION

William E. Collier, 1601 S. Brand Blvd., Glendale, Calif. 91204

Continuation-in-part of Ser. No. 183,078, Jan. 18, 1994, abandoned. This application Sep. 20, 1994, Ser. No. 309,257

Int. Cl.[6] F42B *12/00*

U.S. Cl. 102—501 11 Claims



1. An identifiable bullet, comprising;.

a main projectile portion having a front nose portion and a first rear wall opposite the front nose portion;

a chamber extending from the first rear wall;

at least one annular groove, the at least one annular groove extending outward of the chamber;

an identification section mounted within the chamber adjacent the first rear wall of the main projectile portion; said identification section having indicia affixed thereon for identification of the projectile portion after being discharged from a firearm, wherein the identification section extends into and interlocks with the at least one annular groove; and

plug mounted within the chamber adjacent the identification section to secure and maintain the identification section within the chamber and protect the identification section from damage.

5,485,790

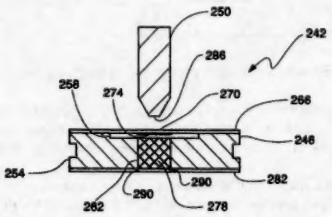
GAS GENERATOR WITH MULTIPLE-CHARGE PRIMER

Brian K. Hamilton, Littleton, Colo., assignor to Oea, Inc., Denver, Colo.

Continuation of Ser. No. 68,889, May 28, 1993, abandoned. This application Mar. 21, 1995, Ser. No. 408,113

Int. Cl.[6] C06D *5/00*

U.S. Cl. 102—531 **22 Claims**



1. A gas generator, comprising:

a gas generator housing comprising at least one gas generator outlet and containing a gas generating propellant;

a primer comprising a primer housing and first and second charges within said primer housing, wherein said primer housing is interconnected with said gas generator housing, wherein said first and second charges are spaced from each other within said primer housing, and wherein said second charge comprises a first surface which projects toward said first charge and has a first surface area, said primer housing further comprising first and second interconnected and aligned bores which collectively extend through said primer housing and input and output discs which close an end of said first and second bores, respectively, said first charge being positioned on an interior surface of said input disc and said second charge being positioned within at least a portion of said second bore;

a firing pin aligned with said primer, said input disc projecting toward said firing pin and said output disc projecting toward said propellant, wherein said firing pin engages said primer to frictionally engage said first and second charges to ignite at least said second charge, said propellant being ignited by said ignition of at least said second charge to generate propellant gases which flow out of said at least one gas generator outlet;

said firing pin concentrating an engaging force between said first and second charges over a region of said first surface of said second charge which is substantially less than said first surface area, wherein a ratio of an area of said region to said first surface area is within the range from about 0.07% to about 2.56%; and

an automotive safety device responsive to said propellant gases.

5,485,791

DEVICE FOR MAINTAINING A REGION OF A CONVEYOR PATH OF AN OVERHEAD CONVEYOR FREE OF CONVEYOR CARRIAGES IN THE EVENT OF AN ALARM

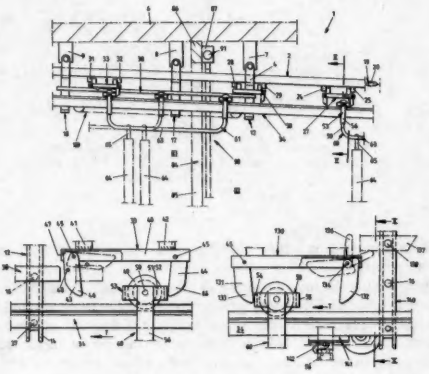
Udo Lubbecke, Detmold; Raif Schneuing, and Gerhard Schilling, both of Bielefeld, all of, Germany, assignors to Dürkopp Adler Aktiengesellschaft, Germany

Filed Feb. 10, 1994, Ser. No. 194,488

Claims priority, application Germany, Feb. 13, 1993, 43 04 369.0

Int. Cl.[6] B65G *17/00*

U.S. Cl. 104—172.4 **8 Claims**



1. An overhead conveyor with an arrangement for clearing conveyor carriages from a predetermined region of a travel rail in the event of an alarm, the overhead conveyor comprising:

a plurality of conveyor carriages received on said travel rail, for travelling along said travel rail;

a drivable pull line associated with said travel rail and driven by a main drive for driving said conveyor carriages;

a plurality of drivers connected to said pull line, at least one of said drivers having at least one stop pawl which has an operating position in which it is disposed for engaging the conveyor carriages travelling along said travel rail, and a non-operative position for allowing said conveyor carriages to travel along said travel rail without said stop pawl engaging said conveyor carriages;

a rail fixed in position in said region to be cleared of conveyor carriages for engaging and placing each stop pawl into its non-operating position while said driver with said stop pawl is in said region be cleared; and

an auxiliary drive in said region which is selectively operable for engaging any conveyor carriage which is present in said region, and for bringing such conveyor carriage out of said region.

5,485,792

LATENT IMAGE DEVELOPMENT SYSTEM

Patrick J. Keyser, Milwaukee; W. James Bousman, Burlington, and Robert W. Biemeck, Racine, all of Wis., assignors to Western Publishing Co., Inc., Racine, Wis.

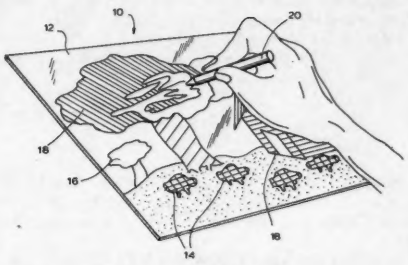
Filed Jul. 7, 1995, Ser. No. 499,680

Int. Cl.[6] C09D *11/02;13/00*

U.S. Cl. 106—21 R **27 Claims**

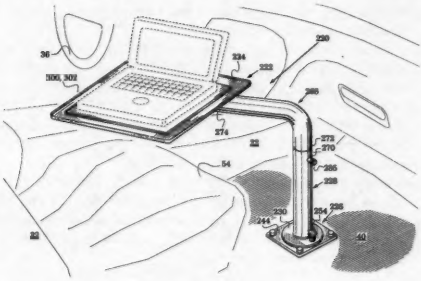
1. A latent image development system for producing a multicolor image on a substrate, comprising in combination:

(A) a substrate having a colorless or faintly colored latent multicolor image thereon, said latent image being formed by a plurality of different color former compositions, each including a Lewis base color former; and



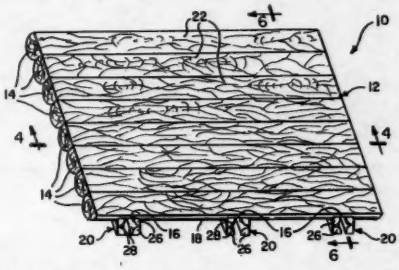
(B) a dispenser adapted to development of said latent multicolor image on said substrate by marking thereover and reacting with a single color developer composition, said color developer composition being free of inorganic metallic salts and including a Lewis acid color developer operative for each of said color former compositions.

5,485,793
VEHICLE DESK
Anthony D. Crowell, 959 Triunfo Canyon, West Lake Village, Calif. 91361
Continuation-in-part of Ser. No. 14,731, Feb. 8, 1993, abandoned. This application Dec. 29, 1993, Ser. No. 175,288
Int. Cl.[6] A47B *23/00*
U.S. Cl. 108—44 **3 Claims**



1. A vehicle desk, comprising:
a base configured for securement thereof to a vehicle floor;
a first support member having upper and lower ends;
a second support member having inner and outer ends;
a shelf defining a work surface;
an annular rim having inner and outer surfaces, said rim defined by one of said base and said first support member lower end;
an annular groove having inner and outer surfaces, said groove defined by the other of said base and said first support member lower end;
said rim supportingly received in said groove;
said inner and outer surfaces of said rim firmly contacting said inner and outer surfaces of said groove to support said first support member against lateral forces thereon, and to resist rotational disengagement of said first support member from said base;
a first socket defined by one of said first support member upper end and said second support member inner end;
a first pin defined by the other said first support member upper end and said second support member inner end;
said first pin rotatably and selectively lockably received in said first socket;
a second socket defined by one of said second support outer end and said shelf;
a second pin defined by the other said second support member outer end and shelf; and,
said second pin rotatably received in said second socket.

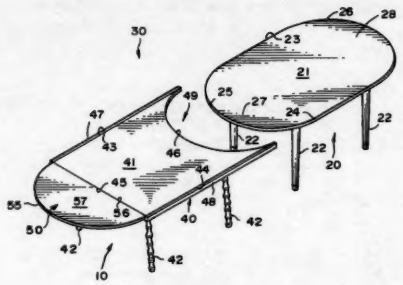
5,485,794
STRUCTURE FOR PALLETS, FLOORING, PANELLING AND FENCING
Peter Sing, P.O. Box 11532, Winslow, Wash. 98110
Filed Apr. 25, 1994, Ser. No. 232,641
Int. Cl.[6] B65D *19/00*
U.S. Cl. 108—51.1 **18 Claims**



18. Structure for pallets, flooring, panelling, and fencing, which comprises:
a plurality of parallelly and adjacently aligned log lengths, each having a planar surface, said log lengths being so oriented that said planar surfaces together form an even level outer surface for the assembled structure, said log lengths being selected from the group consisting of: half-log sections cut longitudinally from small diameter logs, each cut flat surface thereof being part of said outer surface of the assembled structure; and quarter-log sections cut longitudinally, and diametrically twice, into right-angled sectors, said quarter-log sections being attached in pairs so oriented that one of the two cut flat surfaces of each of said attached pairs is in contiguous planar with one of the two cut flat surfaces of its attached quarter-log mate, both being part of said outer surface of the assembled structure;
at least two support rails spacedly and transversely attached to each of said plurality of log lengths on the sides thereof opposite said cut planar surfaces of the structure, said support rails being conventional lumber beams;
means for interlocking each of said plurality of log lengths in said assembly with each of said at least two support rails; and
means for neutralizing variations in thickness, irregularities and taper in each of said plurality of log lengths to ensure the levelness of the assembled structure.

5,485,795
FREE STANDING EXTENSION TABLE AND METHOD OF MANUFACTURE
Jeanne L. Williams, 332 So. Gill St., State College, Pa. 16801
Filed Mar. 29, 1995, Ser. No. 412,947
Int. Cl.[6] A47B *1/04*
U.S. Cl. 108—69 **20 Claims**

1. A table comprising a table top, said table top being generally planar and including diametrically opposite table top portions, a first of said diametrically opposite table top portions including an outwardly opening recess, a second of said diametrically opposite table top portions defining an outwardly directed projection, said table second top portion being defined by a part of said table top removed from said table first top portion to define said projection and form said recess, said recess and said projection each including an edge configuration defined by a respective recess edge and a projection edge, said recess edge and projection edge are substantially of the same contour, and hinge means for hinging said projection to said first table top portion along an edge remote from said recess edge.

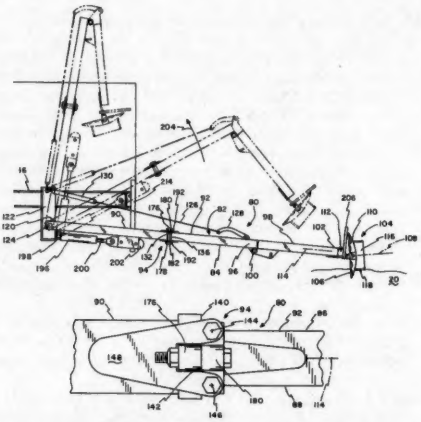


5,485,796

APPARATUS FOR MARKING SOIL

James H. Bassett, Sycamore, Ill., assignor to Dawn Equipment Company, Sycamore, Ill.

Filed Mar. 22, 1994, Ser. No. 215,912
Int. Cl.[6] A01B *39/14;69/02*
U.S. Cl. 111—33 23 Claims



1. An apparatus to be advanced in a travel direction by a vehicle for continuously marking underlying soil, said apparatus comprising:

an elongate body having first and second portions and substantially straight leading and trailing surfaces extending over a substantial length of the elongate body;

means at a first location on said elongate body for engaging and marking underlying soil as the soil marking apparatus is advanced over underlying soil;

means for connecting the elongate body to a vehicle to advance the soil marking apparatus over underlying soil; and

first means cooperating between the first and second elongate body portions for allowing the first portion of the elongate body to reposition relative to the second portion of the elongate body upon the first portion of the elongate body being acted upon by a predetermined force applied in a first direction at a first point,

said first cooperating means including a) a first element having a predetermined tensile strength, b) means for operatively engaging the first element with each of the first and second portions of the elongate body so that a force in excess of the predetermined force applied to the first elongate body portion at the first point in said first direction causes the first element to fall in tension, and c) second means cooperating between the first and second elongate body portions for allowing the first elongate body portion to move guidingly relative to the second elongate body portion under a force applied to the first elongate body portion at the first point in said first direction with the first element failed in tension,

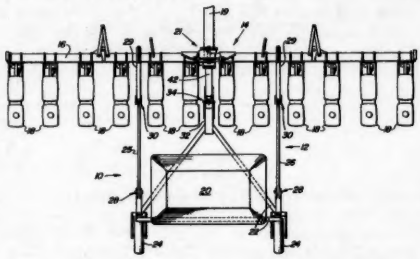
said first element residing between the leading and trailing surfaces of the elongate body.

5,485,797

TRAILING CART FOR AGRICULTURAL TOOLBAR

Lawrence D. Green, Bettendorf, Iowa, and Ronald L. Pratt, Taylor Ridge, Ill., assignors to Deere & Company, Moline, Ill.

Filed Apr. 29, 1994, Ser. No. 236,711
Int. Cl.[6] A01C *1/00;7/00*
U.S. Cl. 111—200 17 Claims



1. A trailing cart for being towed by a transverse toolbar, the cart comprising:

a frame having a pair of caster wheels for supporting the frame as it is moved over a field;

a material carrying hopper being supported on the frame;

first and second draft links pivotally coupled to the frame and extending forwardly from the frame for engagement with said transverse toolbar;

a central hitch located between the first and second draft links and extending forwardly from the frame for engagement with said transverse toolbar; and

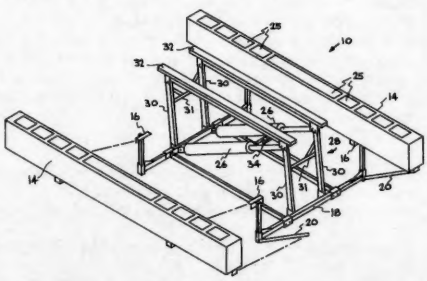
a floating link mounted to the central hitch for coupling the central hitch to said transverse toolbar, the floating link permits the central hitch to move forward and backward relative to said transverse toolbar to which it is attached as the trailing cart moves over uneven terrain.

5,485,798

BOAT LIFT

Ronald P. Samoian, 2022 Montauk Ct., and Scott R. Rister, 2032 Montauk Ct., both of Byron, Calif. 94514

Filed Mar. 24, 1994, Ser. No. 218,062
Int. Cl.[6] B63C *1/00*
U.S. Cl. 114—44 6 Claims



1. A boat lift comprising:

a pair of floats formed of polyurethane foam and a fiberglass casing enclosing the foam;
a plurality of mounting brackets bonded into the floats;
a base frame connected to the mounting brackets;
a pair of hydraulic rams pivotably mounted at one end to the base frame;
a first pair of cantilever arms pivotably mounted to the base frame at the opposite end of the base frame from said one end and having the distal ends of the hydraulic rams pivotably mounted thereto at the ends opposite the ends pivotably mounted to the base frame;
a second pair of cantilever arms pivotably mounted to said one end of the base frame;
a pair of boat hull bunks pivotably and hingedly connected from the first pair to the second pair of cantilever arms;
a locking mechanism for locking the hydraulic rams in an extended position with the first and second pair of cantilever arms in a raised position, said locking mechanism comprising a pair of pins and means for inserting and retracting said pins from the hydraulic rams.

5,485,799

DEVICE WITH AT LEAST ONE VARIABLE-GEOMETRY AERODYNAMIC MEMBER INCLUDING A BOUNDARY LAYER CONTROL SYSTEM

Pierre Julien, 13 rue du Marèchal Joffre, 78110 Le Vesinet, France

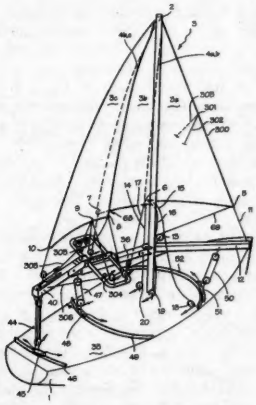
PCT No. PCT/FR92/00330, § 371 Date Oct. 18, 1993, § 102(e) Date Oct. 18, 1993, PCT Pub. No. WO92/18381, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 14, 1992, Ser. No. 137,085

Claims priority, application France, Apr. 17, 1991, 91 04719; May 3, 1991, 91 05445; Jul. 11, 1991, 91 08750; European Pat. Off., Apr. 14, 1992, 92401041

Int. Cl.[6] B63H *9/04*

U.S. Cl. 114—103 **8 Claims**



1. A device for a craft comprising:
(a) at least one element of aerodynamic shape, and having a pressure face side and a suction face side, said at least one element including at least one part for being folded up for propulsion and/or lift of the craft using the effect of wind;
(b) said at least one element comprising a sail structure divided into at least two parts along a dividing line, the at least two parts collectively forming a sail structure surface defining at least one opening therein for providing a passage of air from the pressure face side to the suction face side of said at least one element;
(c) guide means for guiding the air emerging from said at least one opening on the suction face side of said at least one element in a direction tangential to said at least one element, said guide means comprising an overlap zone defined between consecutive ones of the at least two parts, and the sail structure including a slit located at the dividing line and defined by the spacing between the consecutive sail structure parts in the overlap zone, said spacing being maintained by at least one spacer fixed to one of the two consecutive sail structure parts;
(d) first positioning means operatively connected to said at least one element for controlling both the position and the geometry of the at least one part of said at least one element, and for adjusting the geometry and the opening/closing of said at least one opening and said guide means of the air passage; and
(e) second positioning means for setting the geometry of said at least one element, the geometry including the curvature of said at least one element in terms of hollow and in terms of shape.

5,485,800

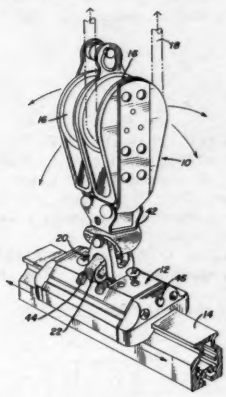
RESILIENT STAND-UP DEVICE FOR BEARING BLOCK

Charles J. Lob, Oconomowoc, Wis., assignor to Harken, Inc., Pewaukee, Wis.

Filed Apr. 13, 1994, Ser. No. 227,123

Int. Cl.[6] B63H *9/10*

U.S. Cl. 114—204 **11 Claims**



1. A device for resiliently mounting an object on a support, said device comprising a hollow rigid member having opposed pairs of outwardly open jaws, one pair of jaws being disposed at right angles to the other, a resilient member disposed in said hollow rigid member and between said jaws, and means between respective jaws for rotatably connecting respective jaws to said object and said support about substantially perpendicular axes, with said resilient member under compression, to resiliently retain the object in an upright position relative to the support, and to resiliently resist rotation about said axes.

5,485,801

APPARATUS AND METHODS FOR SHIELDING THE KEEL AND/OR BOW OF A WATERCRAFT

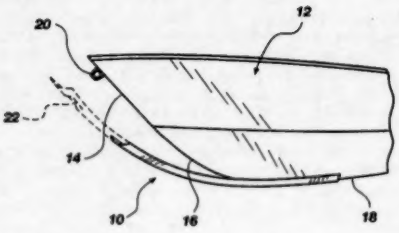
Ronnie D. Gibbs, 2415 S. Redwood Rd., Woods Cross, Utah 84087

Filed Nov. 17, 1994, Ser. No. 341,687

Int. Cl.[6] B63B *59/02*

U.S. Cl. 114—219 **21 Claims**

1. An apparatus for shielding at least a portion of a longitudinally disposed exterior surface of a watercraft from abrasive dam-



age and for improving a hydrodynamic flow of water across said portion of said exterior surface of said watercraft, the apparatus comprising:

means for shielding said portion of said exterior surface of said watercraft, said shielding means having an elongated body, said elongated body having an exterior surface and an opposing contacting surface;

means for securing said contacting surface of said shielding means over said portion of said exterior surface of said watercraft; and

means for reducing drag of said flow of water across said portion of said exterior surface of said watercraft, said drag reducing means comprising at least two elongated channels formed in said exterior surface of said shielding means, wherein each of said elongated channels comprises an angular configuration selectively diverse from said other elongated channel.

5,485,802

METHOD AND APPARATUS FOR PULLING MONOCRYSTALS FROM A MELT

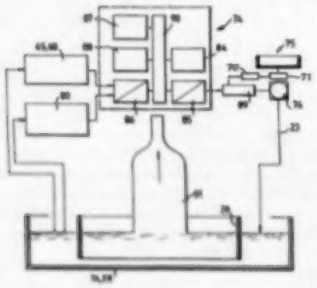
Burkhard Altekrüger, Alzenau; Roland Gesche, Seligenstadt; Martin Flachsel, Bad Vilbel, and Joachim Aufreiter, Alzenau, all of, Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

Filed Jan. 18, 1994, Ser. No. 183,005

Claims priority, application Germany, Jan. 16, 1993, 43 01 072.5

Int. Cl.[6] C30B *15/20*

U.S. Cl. 117—14 **12 Claims**



1. Method for pulling monocrystal from a melt, said method comprising

providing a crucible,

feeding material to be melted to said crucible,

heating said material in said crucible to form a bath of molten material,

pulling said molten material from said crucible to form a monocrystal,

providing an empirically determined data field including at least two parameters from a first group and at least one parameter from a second group, said first group comprising bath temperature, bath level, and crystal diameter, said second group comprising material feed rate, pulling rate, and heater power,

measuring said at least two parameters from said first group, and

controlling said at least one parameter from said second group by means of a fuzzy processor so that said at least two measured parameters from said first group and said at least one parameter from said second group conform to said empirically determined data field.

5,485,803

METHOD OF PREDICTING CRYSTAL QUALITY OF SEMICONDUCTOR SINGLE CRYSTAL AND APPARATUS THEREOF

Ryuichi Habu, Kawasaki, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

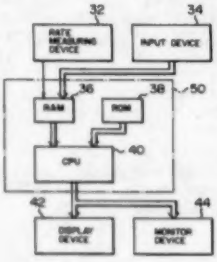
PCT No. PCT/JP94/00006, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO94/16124, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 6, 1994, Ser. No. 302,722

Claims priority, application Japan, Jan. 6, 1993, 5-016771

Int. Cl.[6] C30B *15/20*

U.S. Cl. 117—14 **2 Claims**



1. A method of predicting density and distribution of crystal defects that would appear in a semiconductor wafer during heat treatment processes thereof on the basis of respective densities and distributions of interstitial atoms and atom vacancies frozen, during crystal growth, into a semiconductor single crystal which is used as a raw material for said semiconductor wafer, in a section of said semiconductor single crystal corresponding to said semiconductor wafer, said method comprising the steps of:

obtaining a temperature of the material during crystal growth, which temperature is variable as a function of time and location in the crystal as grown, based on a heat-transfer equation; and

deriving said respective densities and distributions of interstitial atoms and atom vacancies under a condition of the temperature as obtained from a first diffusion equation representing a change with time in concentration of interstitial atoms in the semiconductor single crystal in the course of growth from a melt as a function of a position in the crystal and a second diffusion equation representing a change with time in concentration of atom vacancies in said crystal as a function of a position in the crystal, said first diffusion equation including a term representing contribution of ordinary diffusion of interstitial atoms to the change with time in concentration of interstitial atoms in the crystal, a term representing contribution of uphill diffusion of interstitial atoms to the change with time in concentration of interstitial atoms in the crystal, and a term representing contribution of pair annihilation reaction between interstitial atoms and atom vacancies to the change with time in concentration of interstitial atoms in the crystal, said second diffusion equation including a term representing contribution of ordinary diffusion of atom vacancies to the change with time in concentration of atom vacancies in the crystal, a term representing contribution of uphill diffusion of atom vacancies to the change with time in concentration of atom vacancies in the crystal, and a term representing contri-

bution of pair annihilation reaction between interstitial atoms and atom vacancies to the change with time in concentration of atom vacancies in the crystal.

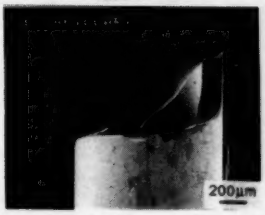
5,485,804

ENHANCED CHEMICAL VAPOR DEPOSITION OF DIAMOND AND RELATED MATERIALS

James J. Adair, and Rajiv K. Singh, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed May 17, 1994, Ser. No. 245,293
Int. Cl.[6] C30B *29/04*
U.S. Cl. 117—90 **12 Claims**

FIGURE 1A



1. A method for the formation of a film composed of a high surface energy material on a substrate comprising the steps of:

(A) providing a substrate having a surface charge opposite to the surface charge of particles of a high surface energy material;

(B) electrostatically adsorbing a number of said particles onto said substrate by exposing said substrate to an aqueous colloidal suspension of said particles of said high surface energy material;

(C) removing said substrate from said aqueous colloidal suspension; and

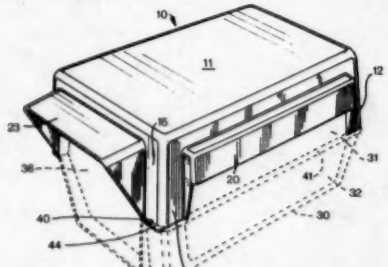
(D) depositing a film of said high surface energy material onto said substrate and said adsorbed particles by chemical vapor deposition.

5,485,805

COVER FOR PET CARRIER

Jay P. Meissner, 4704 Brownville Rd., Powder Springs, Ga. 30073

Filed Jan. 14, 1994, Ser. No. 180,971
Int. Cl.[6] A01K *31/00*
U.S. Cl. 119—17 **2 Claims**



1. A cover for mounting on a live animal shipping container having at least one ventilation opening, comprising:

(a) a top wall and one first side wall which extends downwardly therefrom, the first side wall having a cutout with distal side edges formed therein which, when the cover is mounted on the container, overlays and is at least as large as the ventilation opening;

(b) an awning which extends laterally from the first side wall, the awning defining a structure having first and second side protrusions which extend generally perpendicularly from the first side wall and which oppose each other along the distal side edges of the cutout, the awning preventing rain from entering through the cutout formed in the first side wall and into any ventilation opening which the cutout overlays while allowing free circulation of air through the ventilation opening; and

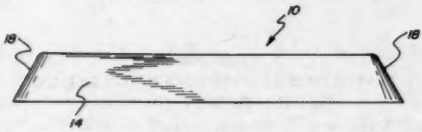
(c) second, third and fourth side walls, the first and second side walls and the third and fourth side walls forming first and second pairs of opposing side walls, respectively; the top wall and the two pairs of opposing side walls defining a watertight cavity.

5,485,806

MOATED PET FOOD TRAY

Masayuki Watanabe, P.O. Box 265194, Daytona Beach, Fla. 32126-5194

Filed Sep. 26, 1994, Ser. No. 318,571
Int. Cl.[6] A01K *5/01;7/00*
U.S. Cl. 119—51.5 **3 Claims**



1. A moated pet food tray comprising:

a main body having a front wall spaced from a rear wall, and an opposed pair of side walls, said main body being shaped so as to define a central cavity;

a divider wall extending across said central cavity to define a water cavity on a first side of said divider wall and a moat cavity on a second side of said divider wall;

and,

a food bowl concentrically positioned within said moat cavity, said food bowl including a food cavity within which food can be positioned,

said main body includes a water cavity floor positioned a first distance from a ground surface upon which said moated pet food tray resides, and a moat cavity floor positioned a second distance from said ground surface,

said main body further includes a transfer hole permitting fluid communication between said moat cavity and said water cavity, said transfer hole being defined by a lower edge of said divider wall extending across an arcuate surface of said main body located between said water cavity and said moat cavity, said arcuate surface integrally connecting said water cavity floor to said moat cavity floor, wherein water positioned within said water cavity will enter said moat cavity through said transfer hole to an equal level on both said of said divider wall.

5,485,807

HAND-HELD BRUSH

Dale E. Bertwell, Denver, and Joseph P. Markham, Arvada, both of Colo., assignors to B & G Ventures, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 162,269, Dec. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 13,697, Sep. 30, 1993, Pat. No. Des. 356,685. This application Apr. 11, 1994, Ser. No. 225,566
Int. Cl.[6] A01K *13/00*
U.S. Cl. 119—93 **6 Claims**

1. A brush for grooming animals wherein said brush has a top surface and a bottom surface, said brush comprising:

an oval body section;

a smaller oval head section connected to said body section;

a protruding first ear integral with said smaller oval head section; and

a second protruding ear spaced from said first protruding ear and integral with said smaller oval head section; and

a plurality of bristles integral with said bottom surface of said brush.

5,485,808

SYNTHETIC SEA WATER SOLUTION KIT AND METHOD OF MANUFACTURE

David A. Huebner, 724-9th Ave. S., South St. Paul, Minn. 55075

Filed Feb. 26, 1993, Ser. No. 22,993

Int. Cl.[5] A01K *63/04*

U.S. Cl. 119—231 **2 Claims**

1. A synthetic sea water kit comprising a first container containing a first concentrated aqueous solution of dissolved inorganic salts (Part A) and a second container containing a second concentrated aqueous solution of dissolved inorganic salts (Part B), wherein said Part A optimally contains approximately 89,200 milligrams per liter chloride ion, 52,600 milligrams per liter sodium ion, 25,350 milligrams per liter sulfate ion, 9,450 milligrams per liter magnesium ion, 50 milligrams per liter potassium ion, 1,450 milligrams per liter bicarbonate ion, 250 milligrams per liter borate ion, and 80 milligrams per liter silicate ion, and said Part B optimally contains approximately 99,800 milligrams per liter chloride ion, 52,100 milligrams per liter sodium ion, 3,000 milligrams per liter magnesium ion, 4,000 milligrams per liter calcium ion, 3,950 milligrams per liter potassium ion, 600 milligrams per liter bromide ion, and 100 milligrams per liter strontium ion.

5,485,809

CHEWABLE ANIMAL TOY

Francis C. Carroll, Philadelphia, Pa., assignor to EPP, Inc., Philadelphia, Pa.

Filed May 6, 1994, Ser. No. 239,114

Int. Cl.[5] A01K *29/00*

U.S. Cl. 119—710 **19 Claims**

1. A chewable animal toy comprised of a single ethylene/methacrylic acid copolymer, ionically cross-linked ionomer resin having a hardness such that when chewed by an intended animal, the toy does not puncture, splinter, shatter, or crack, or prevent biting into said resin but instead shaves off and roughens and bristles whereby the animal is satisfied with the gnawing action and the animal's teeth are scoured and cleaned.

5,485,810

LEASH-CONTROLLABLE DOG HARNESS HAVING PROTECTIVE SLEEVES

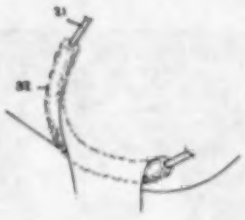
Joseph S. Spera, 274 W. 86th St. #4B, New York, N.Y. 10024

Continuation of Ser. No. 194,720, Feb. 10, 1994, Pat. No. 5,359,964, which is a continuation-in-part of Ser. No. 23,638, Feb. 26, 1993, Pat. No. 5,329,885. This application Apr. 4, 1994, Ser. No. 222,034

The portion of the term of this patent subsequent to Nov. 1, 2011, has been disclaimed.

Int. Cl.[5] A01K *27/00*

U.S. Cl. 119—792 **6 Claims**



1. A harness for a dog having right and left foreleg crotches leading to sensitive foreleg pits, and a leash coupled to the harness which extends to the rear of the dog to effect control of the dog; said harness comprising two straps which pass through the respective crotches and are coupled to the leash whereby when the leash is pulled, the straps then ride up the crotches to press against the foreleg pits to control the dog, each strap having mounted thereon a tubular sleeve of flexible material which extends through the related crotch and engages the related foreleg pit, the strap being slidable in the sleeve whose exterior is formed of soft material to prevent chafing of the dog by the sliding strap.

5,485,811

STRETCHABLE MOLDED LEASH

Chris J. Jacobsen, 4020 County Rd. M, Middleton, Wis. 53562, and Kenneth Muderlak, Shorewood, Wis., assignors to Chris J. Jacobsen, Middleton, Wis.

Filed Jul. 28, 1994, Ser. No. 282,039

Int. Cl.[5] A01K *27/00*

U.S. Cl. 119—798 **20 Claims**

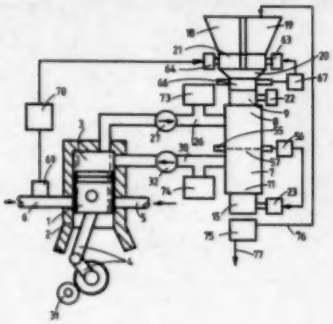
1. A one-piece molded animal leash comprising a handle and a lead, wherein the handle includes a base member, two side members, and a web-like generally planar strengthening piece, wherein the side members extend from the base member to the lead to define a generally triangular shape for the handle, and further wherein the strengthening piece extends from one side member to the other side member and is oriented generally parallel to the plane defined by the handle.

5,485,812

MULTIPLE SOURCES REFUEL MECHANISM

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Filed Jan. 26, 1995, Ser. No. 378,639
Int. Cl.[6] F02B 45/00
U.S. Cl. 123—23 4 Claims



1. A multiple solids sources refuel means for creating a single final premixed refuel material, containing portions from each of said multiple sources, and for inserting said final premixed refuel material into a reaction chamber, and comprising:

at least two separate primary sources of refuel materials contained in separate source hoppers and each said source hopper comprising an outlet;

at least one blender means for proportioning, transferring, and mixing two separate refuel materials, each said blender means comprising;

a blender inlet for two separate refuel materials to be premixed;

proportioner means for proportioning the volumetric ratio of two separate refuel materials, and comprising means for adjusting said volumetric ratio;

mixer means for mixing two separate refuel materials together to create a single premixed refuel material;

a receiving hopper for receiving and containing premixed refuel materials and comprising an outlet;

transfer means for transferring refuel materials from said blender inlet into said receiving hopper through said proportioner means followed by said mixer means, and comprising transfer drive means for driving said transfer means;

said inlet of each said blender means being connected to the outlet of two hoppers for containing refuel materials;

a refuel mechanism means for inserting refuel materials into said reaction chamber, and comprising refuel drive means for driving said means for inserting and adapted to carry out said insertion over a refuel process time interval, and adapted to apply a compression force to the contents of said reaction chamber, at all times when said reaction chamber is operating except during said refuel process time interval, said refuel mechanism means comprising an inlet for refuel materials;

that one final receiving hopper, containing solid materials from all of said at least two separate primary sources of refuel materials, being connected, via its outlet, to the inlet of said refuel mechanism means for inserting materials;

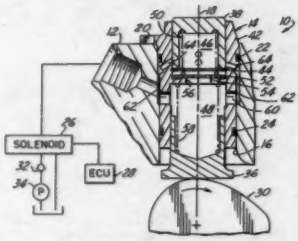
each said source and receiving hopper containing refuel materials, except said one final receiving hopper, being connected via its outlet to the blender inlet of one of said blender means.

5,485,813

LOST MOTION ACTUATOR WITH DAMPING TRANSITION

Mark R. Molitor, Muskegon, Minn., and James T. Robnett, Royal Oak, Mich., assignors to Siemens Automotive Corporation, Auburn Hills, Mich.

Filed Jan. 11, 1995, Ser. No. 371,250
Int. Cl.[6] F01L 1/16
U.S. Cl. 123—90.12 8 Claims



1. A lost motion hydraulic actuator for use between a cam and a valve of an internal combustion engine and including a housing defining first and second oppositely opening coaxial cylinders, a first piston reciprocable in the first cylinder and defining a first chamber therein, a second piston reciprocable in the second cylinder and defining a second chamber therein, first biasing means urging the first piston axially outwardly toward operative connection with such cam, second biasing means urging the second piston axially outward toward operative connection with such valve, inlet means for admitting hydraulic fluid into said first chamber, a restrictive orifice continuously interconnecting said chambers for damping valve seating motion during valve closing, one way bypass flow means permitting flow around said orifice from said first chamber to said second chamber during valve opening, and secondary communication means between said chambers including a plurality of ports through said second cylinder and controlled by said second piston, said ports being open during valve lift beyond an initial amount for free flow of fluid between the chambers and said ports being closed by the piston prior to seating of the valve requiring flow from the second chamber to pass through said orifice for damping valve seating, the actuator being characterized in that:

said ports and said second piston are configured to provide sequential closing of the ports during valve closing to limit the rate of change of fluid flow from the second chamber and provide a smooth transition to the inception of damping.

5,485,814

RESETTING IGNITION SWITCH FOR A GASOLINE POWERED CHAIN SAW

Lloyd H. Tuggle, and Paul A. Warfel, both of Shreveport, La., assignors to WCI Outdoor Products, Inc., Cleveland, Ohio

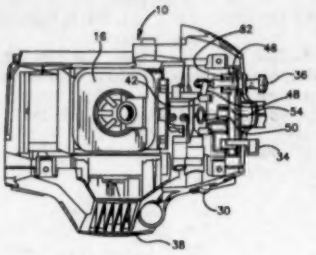
Filed Mar. 1, 1995, Ser. No. 396,676
Int. Cl.[6] F02D 37/02
U.S. Cl. 123—179.5 17 Claims

1. An ignition system for a portable power tool, comprising:

a choke assembly manually movable between a normal, first position and a choking, second position;

an ignition switch manually movable between a run position and a stop position; and,

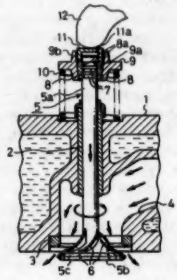
a member operatively interconnecting said choke assembly and said ignition switch whereby movement of said choke assembly into said choking position moves said ignition switch into said run position, and wherein said ignition switch is freely movable independent of said choke assembly when said choke assembly is in said normal position.



5,485,815
POPPET VALVE DEVICE

Toshimitsu Shida, Fujisawa, Japan, assignor to Fuji Oozx Inc., Fujisawa, Japan

Filed May 12, 1995, Ser. No. 439,789
Claims priority, application Japan, Nov. 25, 1993, 5-295460
Int. Cl.[6] F01L *3/06;3/20*
U.S. Cl. 123—188.3 7 Claims



1. A poppet valve device comprising:

a valve which comprises a valve stem and a valve head which is provided at a lower end of the valve stem, a circumferential groove being formed at an upper end of the valve stem;

a valve casing having first and second ports, the valve stem being slidably fitted in the valve casing;

a pair of semicylindrical cotters which are tapered downward, the cotters having a circumferential projection which is engaged in the circumferential groove of the valve stem with a small gap;

a valve spring;

a valve spring retainer which is urged by the valve spring, the cotters being fitted in the retainer so that the cotters and the retainer are engaged with the valve stem;

a press member on the cotters; and

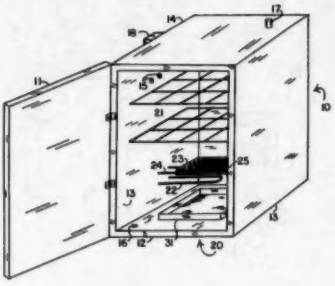
push means for pushing the press member, the press member being pushed by the push means to press the cotters to move the valve downward so that the first port of the valve casing is opened or closed by the valve head, the valve head having a plurality of arcuate fins radially formed around its axis, thereby rotating the valve little by little by pressure of fluid which flows between the fins.

5,485,816
CHARCOAL BURNING COOKING DEVICE

Verlon F. Cox, 1576 Lake Shore Blvd., Jacksonville, Fla. 32210, and Don Chaney, 6086 Gulf Rd. North, Jacksonville, Fla. 32244

Filed Sep. 27, 1994, Ser. No. 312,873
Int. Cl.[6] F24B *3/00*
U.S. Cl. 126—25 R 6 Claims

1. A food cooking oven which utilizes charcoal to supply the

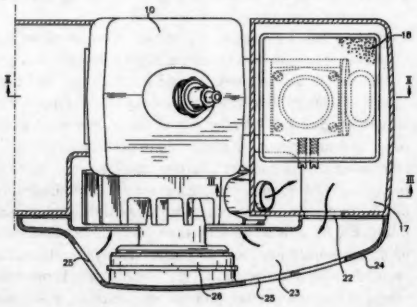


heat to cook the food, said oven comprising a housing, a door, a charcoal container, charcoal ignition means, a thermostat to monitor internal temperature within the housing, and temperature controller means connected to said thermostat and said charcoal ignition means, whereby said temperature controller means activates and deactivates said charcoal ignition means in response to said internal temperature, said charcoal ignition means and said charcoal container being in close proximity to one another such that said charcoal ignition means ignites and reignites charcoal contained in said charcoal container.

5,485,817
ARRANGEMENT IN AN INTERNAL COMBUSTION ENGINE

Sven G. B. Dahlberg, Gränna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 21, 1995, Ser. No. 391,549
Claims priority, application Sweden, Mar. 9, 1994, 9400795
Int. Cl.[6] F02B *77/00*
U.S. Cl. 123—198 E 6 Claims



1. Arrangement in a two-stroke internal combustion engine, said engine comprising a crankcase (12), a fan housing (19) having an impeller (20), and a carburetor chamber (17) having a carburetor (16), said carburetor being connected to said crankcase via an intake passage (15) and said carburetor chamber being connected via an inlet passage (21) to said fan housing on an outlet side of said impeller, wherein the carburetor chamber (17) has an opening (22) connected to a low pressure zone of the housing (19).

5,485,818

DIMETHYL ETHER POWERED ENGINE

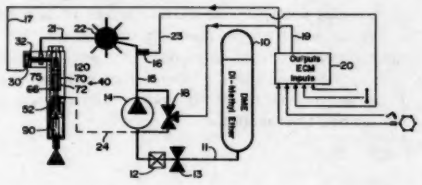
James C. McCandless, Grosse Pointe Park, Mich., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Feb. 22, 1995, Ser. No. 393,103

Int. Cl.[6] F02B *3/00*

U.S. Cl. 123—294 **15 Claims**

1. An internal combustion engine of the type that includes at



least one combustion cylinder, a fuel storage tank, an accumulator connected to the fuel storage tank by a conduit and a fuel delivery system for delivering fuel from the accumulator to said at least one combustion cylinder wherein the improvement comprises:

said internal combustion engine being fueled by dimethyl ether;

means for pressurizing said fuel storage tank;

an engine driven fuel pump in said conduit that has the capacity to deliver fuel, during engine start-up, to said accumulator at a pressure in the range of 100–300 bar;

a fuel injection system including a unit injector which injects said dimethyl ether directly into for said at least one combustion cylinder, said injector including a nozzle that can vary the fuel flow rate as a function of injection pressure, said unit injectors including a solenoid that controls injection timing and the duration of the injection cycle.

5,485,819

INTERNAL COMBUSTION ENGINE

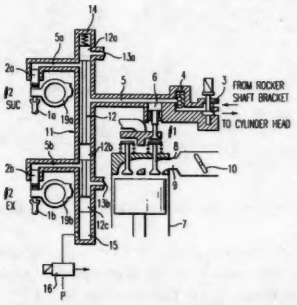
Isao Joko; Toshiaki Kakegawa, and Seiji Shundo, all of Hino, Japan, assignors to Hino Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 169,075, Dec. 20, 1993, Pat. No. 5,406,918. This application Aug. 4, 1994, Ser. No. 285,425

Claims priority, application Japan, Aug. 4, 1993, 5-211050; May 23, 1994, 6-108406

Int. Cl.[6] F02D *13/04*

U.S. Cl. 123—321 **8 Claims**



1. A four stroke internal combustion engine, comprising a first cylinder, a first master piston, a first rocker arm in engagement with said first master piston, a first oil passage supplied with oil under pressure, an exhaust valve and an exhaust port on said first cylinder, and a slave piston associated with said first cylinder, a first end of said slave piston communicating with said first oil passage and a second end of said slave piston arranged adjacent said exhaust valve; a first component associated with a second cylinder for actuating said first master piston through said first rocker arm when said first cylinder is near top dead center on a compression stroke; a second oil passage which may be selectively placed in communication with said first oil passage; a first end of said first master piston communicating with said second oil passage whereby when said first oil passage and said second oil passage communicate the actuation of said first master piston causes an increase in the pressure in said first and second oil passages to actuate said slave piston to open said exhaust valve as said first cylinder is near a top dead center position on a compression stroke resulting in the discharge of compressed gas through said exhaust port so that the energy used to compress the gas in said first cylinder is utilized to brake the engine without the loss that would occur due to a compressed gas return force; the improvement comprising a second master piston, a second rocker arm in engagement with said second master piston, said second master piston and said second rocker arm being associated with said first cylinder; a second component associated with said second cylinder for actuating said second master piston through said second rocker arm when said first cylinder is near bottom dead center on a suction stroke; a third oil passage which may be selectively placed in communication with said first oil passage; a first end of said second master piston communicating with said third oil passage whereby when said first oil passage and said third oil passage communicate the actuation of said second master piston causes an increase in the pressure in said first and third oil passages to actuate said slave piston to open said exhaust valve as said first cylinder is near a bottom dead center position on a suction stroke resulting in the flow of exhaust gases into said first cylinder; an oil passage selector valve arranged to selectively open communication between said second oil passage and said first oil passage or between said third oil passage and said first oil passage whereby when said oil passage selector valve is arranged to permit communication between said second oil passage and said first oil passage said first master piston effects operation of said slave piston and said exhaust valve is opened when the piston of said first cylinder is near a top dead center position on a compression stroke to enhance engine braking and when said oil selector valve is arranged to permit communication between said third oil passage and said first oil passage said second master piston effects operation of said slave piston and said exhaust valve is opened when said first cylinder is near bottom dead center on a suction stroke to effect exhaust-gas-recirculation into said first cylinder of the exhaust gas from another cylinder which is then on its exhaust stroke.

5,485,820

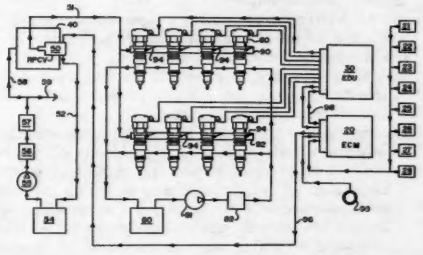
INJECTION CONTROL PRESSURE STRATEGY

Titus Iwaszkiewicz, Woodridge, Ill., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Sep. 2, 1994, Ser. No. 300,292

Int. Cl.[6] F02M *41/00*

U.S. Cl. 123—458 **7 Claims**



2. The method of adjusting the rail pressure in a hydraulically-operated, electronically-controlled fuel injector operating system of the type having a plurality of fuel injectors, a high pressure injector fluid pump, a rail pressure control valve for the high

pressure injector fluid pump, a rail connected by a passage to the outlet of said control valve, a passage from said rail to individual injectors, an electronic control module that senses engine conditions and is programmed to use the sensed data to calculate a desired injection fluid rail pressure and to send a duty signal to said rail pressure controlled valve that will cause the control valve to adjust the rail pressure toward the calculated desired injection fluid rail pressure, a fuel supply connected to said injectors, electronically control valves in said injectors for controlling the application of said actuating fluid to cause injection of fuel from said injectors, comprising the steps of:

(a) providing a duty cycle lookup table having desired rail pressure on one axis and rail pressure control valve flow on the other axis;

(b) calculate desired rail pressure;

(c) calculate rail pressure control valve flow;

(d) select the duty cycle from the duty cycle lookup table using the calculated desired rail pressure and rail pressure control valve flow; and

(e) transmit the selected duty cycle to the rail pressure control valve.

5,485,821

ENGINE FUEL INJECTION CONTROLLER

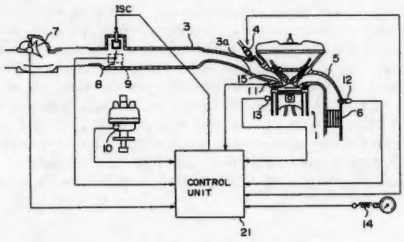
Kodai Yoshizawa, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 15, 1994, Ser. No. 306,621

Claims priority, application Japan, Sep. 22, 1993, 5-236375

Int. Cl.[6] F02M *51/00*

U.S. Cl. 123—478 **8 Claims**



1. A fuel injection controller in an engine comprising a cylinder, an intake passage provided with a valve that aspirates air into said cylinder, a throttle for regulating the flowrate in said passage, and an injector provided between said throttle and said valve for injecting fuel into said passage according to an input signal, said controller comprising:

means for detecting an engine running condition, said detected engine running condition being one of plurality of possible engine running condition,

means for detecting a temperature of a part of said passage to which injected fuel adheres, said detected temperature being one of a plurality of possible temperature,

a processor programmed to perform the following functions,

a) calculating a basic fuel injection amount based on said detected engine running condition,

b) computing and storing short-term delay correction amounts respectively corresponding to said plurality of possible engine running conditions and said plurality of possible temperatures of said part, said short-term delay correction amounts compensating for a delayed flow in said passage having a time constant greater than a predetermined value,

c) computing and storing long-term delay correction amounts respectively corresponding to a said plurality of possible engine running conditions and said plurality of possible temperatures of said part, said long-term delay correction amounts compensating for a delayed flow in said passage having a time constant less than said predetermined value,

d) reading a short-term delay correction amount from said stored short-term delay correction amounts which corresponds to said detected engine running condition and said detected temperature,

e) reading a long-term delay correction amount from said stored long-term delay correction amounts which corresponds to said detected engine running condition and said detected temperature, and

f) correcting said basic fuel injection amount by said short-term and long-term read correction amounts, and

means for applying a signal corresponding to said corresponding fuel injection amount to said injector. correction amount and to an updating amount of said long-term delay correction amount based on said factor.

5,485,822

FUEL INJECTION CONTROLLER FOR USE IN AN INTERNAL COMBUSTION ENGINE

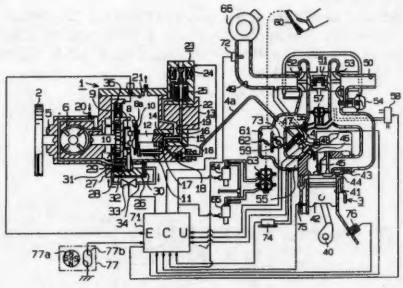
Katsuhiko Hirose; Takao Tate, both of Susono; Norihiko Nakamura, Mishima; Takeshi Sato, Susono; Kazuhiro Iwahashi, Susono; Shinji Kamoshita, Susono, and Akihiro Yamanaka, Susono, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 20, 1993, Ser. No. 109,765

Claims priority, application Japan, Aug. 20, 1992, 4-221640; Aug. 21, 1992, 4-223084; Sep. 4, 1992, 4-237453; Feb. 4, 1993, 5-017642; Mar. 11, 1993, 5-050972; Mar. 11, 1993, 5-050973

Int. Cl.[6] F02M *37/04*

U.S. Cl. 123—501 **14 Claims**



1. A fuel injection control apparatus for a combustion engine comprising:

a nozzle for injecting pressurized fuel into the engine when a fuel pressure value is in excess of a predetermined value;

a pump for supplying the fuel to the nozzle;

means for detecting the fuel pressure value in a fuel passage between the pump and the nozzle;

means for computing a rate of increase or decrease in the fuel pressure based on the detected pressure value;

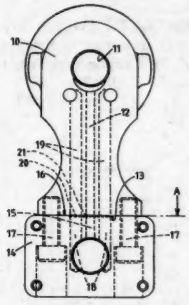
means for determining the fuel injection timing value based on a computed rate of zero, wherein said determining is delayed until a predetermined time has elapsed after the computed rate is changed from a positive value to a negative value.

5,485,823

FUEL PUMP HAVING A LEAKED FUEL CONVEYING STRUCTURE

Edward R. Lintott, London, and Colin T. Timms, Middlesex, both of, England, assignors to Lucas Industries public limited company, West Midlands, England

Continuation of Ser. No. 70,375, Jun. 1, 1993, abandoned.
This application Nov. 22, 1994, Ser. No. 343,355
Claims priority, application United Kingdom, Dec. 11, 1990, 9026840
Int. Cl.[6] F02M *59/44*
U.S. Cl. 123—506 **2 Claims**



1. A unit injector for supplying fuel to an engine comprising a main body (**10**) in which is formed a bore (**11**) which houses a cam actuated pumping plunger (**8**), a pumping chamber (**7**) defined by part of the bore, and an outlet from the pumping chamber which is connected to a fuel injection nozzle mounted on the main body (**10**), electromagnetically operated spill valve (**14**) mounted on the main body (**10**), a spill passage (**12**) formed in the main body (**10**) communicating with said pumping chamber (**7**) under high pressure produced by said pumping plunger and with a connecting passage (**15**) formed in the spill valve (**14**), said main body (**10**) and said spill valve (**14**) defining surfaces (**13,16**) which are secured together, a low pressure drain passage (**18,19**) extending between said main body and said spill valve for transporting fluid leaked from said passages (**12,15**) at said surfaces (**13,16**), a fluid collection structure (**21**) being disposed on one of said surfaces (**13,16**) surrounding the respective passage (**12,15**) opening thereon, said fluid collection structure engaging the other surface about the passage opening thereon, said fluid collection structure comprising:

an annular depression (**20**) formed in said one surface, said annular depression being defined by an inner perimeter which is spaced away from said passages (**12,15**);

a rim being defined between said annular depression and said passages;

a face of said rim abutting the other of said surfaces (**13,16**) generally preventing fluid from escaping from said passages (**12,15**) at the interface of said surfaces (**13,16**); and

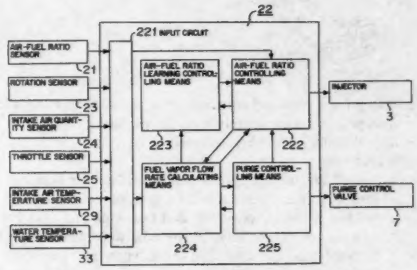
said drain passage (**18,19**) communicating with said depression for draining fuel which is forced under high pressure between said face of said rim and said other surface into said depression and preventing the leaked fuel from leaking to the exterior of said main body (**10**) and said spill valve (**14**).

5,485,824

ELECTRONIC CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Katsuhiko Kondou, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 308,512
Claims priority, application Japan, Jun. 30, 1994, 6-149755
Int. Cl.[6] F02M *33/02;25/08*
U.S. Cl. 123—520 **12 Claims**



2. An electronic control device for an internal combustion engine comprising:

fuel controlling means for controlling a quantity of fuel supplied to an engine;

an air-fuel ratio sensor for detecting an air-fuel ratio from an exhaust gas;

air-fuel ratio controlling means for calculating an air-fuel ratio correction coefficient such that the air-fuel ratio of fuel vapor supplied to the engine has a predetermined value based on a signal from the air-fuel ratio sensor, and for controlling the fuel controlling means by a feedback control;

a purge passage for supplying to the engine evaporated fuel which has evaporated in a fuel tank;

a canister provided in the purge passage for adsorbing the evaporated fuel;

fuel vapor flow rate calculating means for switching on or off a purge control in correspondence to a running condition of the engine and for calculating a flow rate of the fuel vapor wherein the evaporated fuel which has been adsorbed by the canister is mixed with air in accordance with an operating state of the engine when the purge control is switched on; and

purge controlling means for driving a purge control valve provided between the canister and an intake air passage such that the calculated flow rate of the fuel vapor is supplied to the engine;

wherein the fuel vapor flow rate calculating means corrects the flow rate of the fuel vapor when the purge control is switched on based on at least a period of time that the purge control has been switched off immediately before the purge control is switched on, a degree which the purge control valve was opened during a preceding period of time during which the purge control was switched on, and a length of the preceding period of time.

5,485,825

INTERNAL COMBUSTION ENGINE IGNITION DEVICE

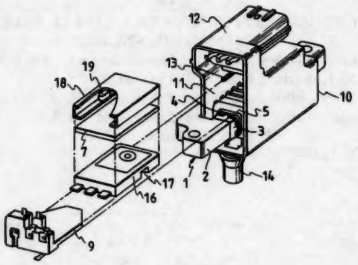
Takeshi Shimizu; Masaaki Taruya; Shigemi Murata; Mitsuru Koiwa, and Toshio Maekawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1994, Ser. No. 259,682
Claims priority, application Japan, Jul. 9, 1993, 5-170414
Int. Cl.[6] F02P *3/02*
U.S. Cl. 123—634 **4 Claims**

1. An internal combustion engine ignition device comprising:

an ignition coil;

a preliminary assembly; and



a casing for accommodating and covering said ignition coil and said preliminary assembly with an insulating resin;

said preliminary assembly comprising:

a heat sink;

a control unit comprising a control circuit for controlling a flow of primary current in said ignition coil; and

a cushion cover for covering said heat sink and said control unit, and absorbing thermal stress between said preliminary assembly and the insulating resin, wherein at least one first protrusion is formed on said cushion cover, and at least one first recess is formed on said control unit for engaging with said first protrusion of said cushion cover.

5,485,826

AIR-FUEL RATIO CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

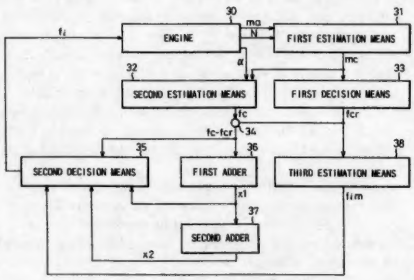
Akira Ohata, Mishima, and Hiroshi Sawada, Gotenba, both of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 24, 1994, Ser. No. 217,109

Claims priority, application Japan, Mar. 26, 1993, 5-068391

Int. Cl.[6] F02D *41/14*

U.S. Cl. 123—679 **7 Claims**



1. An air-fuel ratio control device for an internal combustion engine having an intake passage and an exhaust passage with a three way catalytic converter, comprising:

a fuel injector for injecting fuel;

an air-fuel ratio detector for detecting an air-fuel ratio in the engine cylinder, which is arranged in said exhaust passage upstream of said three way catalytic converter;

first estimation means for estimating an amount of intake air actually fed into the engine cylinder;

first decision means for deciding a target amount of fuel which must be fed into the engine cylinder to realize the stoichiometric air-fuel ratio, on the basis of the amount of intake air estimated by said first estimation means;

second estimation means for estimating an amount of fuel actually fed into the engine cylinder, on the basis of the air-fuel ratio detected by said air-fuel ratio detector and the amount of intake air estimated by said first estimation means; and

second decision means for deciding an amount of fuel actually injected by said fuel injector such that a difference between the amount of fuel estimated by said second estimation means and the target amount of fuel decided by said first decision means, and a time integration value of said difference are made to converge to "0" at the same time.

5,485,827

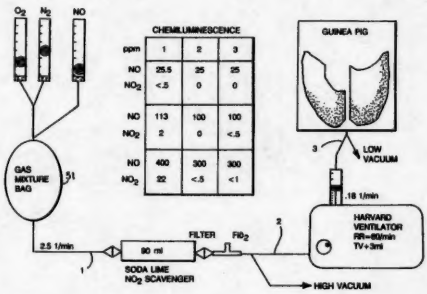
METHODS AND DEVICES FOR TREATING PLUMONARY VASOCONSTRICTION AND ASTHMA

Warren M. Zapol, Concord, Mass., and Claes Frostell, Danderyd, Sweden, assignors to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 767,234, Sep. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 622,865, Dec. 5, 1990, abandoned. This application Feb. 10, 1995, Ser. No. 384,792

Int. Cl.[6] A61M *11/00*

U.S. Cl. 128—200.14 **39 Claims**



1. A method for treating or preventing reversible pulmonary vasoconstriction in a mammal, which method comprises

providing gaseous nitric oxide (NO) mixed, immediately prior to inhalation, with an oxygen-containing gas to form a gas mixture containing a therapeutically effective concentration of NO; and

causing a mammal in need of such treatment or prevention to inhale a therapeutically effective amount of said NO-containing gas mixture.

5,485,828

PORTABLE DEVICE FOR MICROPULVERIZATION GENERATED BY ULTRASOUND WAVES

Jean-Luc Hauser, 1499 chemin S. Maymes, F-06600 Antibes, France

PCT No. PCT/FR93/00411, § 371 Date Dec. 28, 1993, § 102(e) Date Dec. 28, 1993, PCT Pub. No. WO93/22068, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 28, 1993, Ser. No. 170,221

Claims priority, application France, Apr. 29, 1992, 92 05306

Int. Cl.[6] A61M *11/00*

U.S. Cl. 128—200.16 **8 Claims**

1. A micropulverization device for the formation of microdroplets comprising: an ultrasound generator;

a reservoir containing a liquid to be micropulverized;

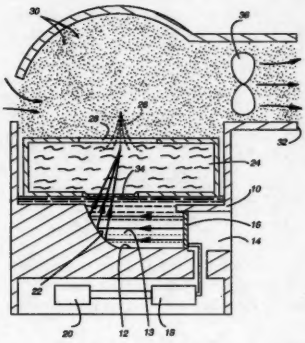
a cell for containing a propagation medium, said cell being located between said ultrasound generator and said reservoir;

means for concentrating ultrasound waves from said ultrasound generator toward a point near the surface of said liquid in said reservoir for micropulverization of said liquid;

a chamber for the formation of microdroplets; and

means for diffusing said droplets;

said propagation medium having an ultrasound attenuation less than or equal to 1 dB/cm.



5,485,829

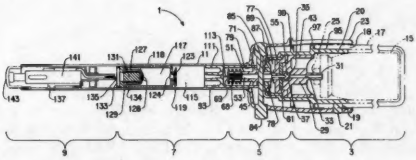
CENTRAL BODY FOR USE IN REGULATION SYSTEMS OF CATALYTIC BURNERS

Daniel Santhouse, Wilton, and H. Roy Taylor, Stratford, both of Conn., assignors to Conair Corporation, Stamford, Conn.

Filed May 31, 1994, Ser. No. 251,755

Int. Cl.[6] F23Q *2/00;2/42*

U.S. Cl. 126—409 **8 Claims**



1. In combination a central body and a gas burner unit, said gas burner unit having a casing, a curling iron barrel, and a control stem with a control stem longitudinal axis, said central body being moldable as an integral piece,

said central body having an outer surface, an inner surface, and a central body longitudinal axis, said central body having a generally rotational symmetry about said central body longitudinal axis,

said outer surface of said central body having spacers thereon dimensioned to position said central body within said casing, said outer surface including an outer surface portion for holding said curling iron barrel, and

said inner surface having an inner surface portion for holding said control stem within said body unit with said control stem longitudinal axis and said central body longitudinal axis being a common axis.

5,485,830

MODULAR FIREPLACE WITH INTERCHANGEABLE BURNER ASSEMBLY AND HEAT EXCHANGE INSERT

Lothar Binzer, 5721 124th Street, Surrey, B.C., Canada

Filed Nov. 17, 1993, Ser. No. 154,285

Int. Cl.[6] F24C *3/00*

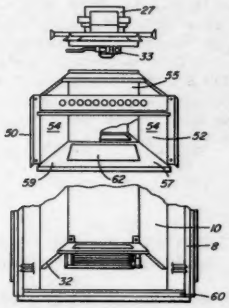
U.S. Cl. 126—512 **11 Claims**

1. A modular gas fireplace assembly for connection to a venting system comprising:

an outer shell into which the venting system extends;

a fireplace unit insertable within the shell having an open front, a pair of side walls, a rear wall and a roof with first predetermined dimensions;

means for generating heat comprising



a heat exchange unit comprising an insert insertable within the fireplace unit having a floor formed by the platform, an open front, a pair of sidewalls, a rear wall, and a roof, and means forming at least one heat exchange air passage extending adjacent the insert, and

a platform with an attached gas burner, means for communicating the gas burner with a source of gas, and a control valve for the gas burner;

a shelf formed in the fireplace unit to support the platform to define a floor with a second predetermined dimension for the fireplace unit; and

means for communicating the fireplace unit with the venting system;

whereby the second predetermined dimension of the shelf and the first predetermined dimensions of the fireplace unit accommodate removable receipt of the platform in a set position that automatically locates the gas burner for safe operation within the fireplace unit to permit interchange of different means for generating heat by insertion of different platforms.

5,485,831

PULSE-INJECTOR FOR QUANTITATIVE ANGIOGRAPHIC BLOOD-FLOW MEASUREMENTS

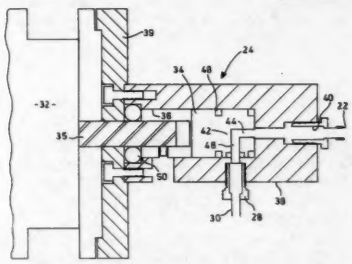
David W. Holdsworth; Maria Drangova, and Aaron Fenster, all of London, Canada, assignors to University Hospital (London) Development Corporation, Ontario, Canada

Filed Nov. 30, 1993, Ser. No. 159,166

Claims priority, application United Kingdom, Nov. 30, 1992, 9225014

Int. Cl.[6] A61M *25/00*

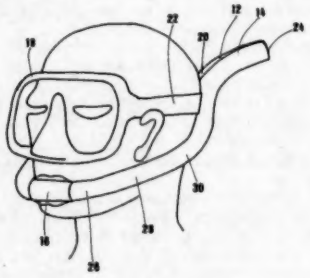
U.S. Cl. 128—654 **35 Claims**



1. Injection apparatus for quantitative angiographic blood flow measurements by injection of a contrast agent into a fluid transporting vessel, said apparatus comprising a pressurized source of contrast agent, a catheter for conducting the contrast agent from the source into the vessel, a control valve to control flow of said agent between said source and said vessel, said control valve having an inlet port connected to said source, an outlet port

connected to said catheter and a valve body within a housing and including a passageway to extend between said inlet and outlet port, said valve body being rotatable within said housing between an open position in which flow between said inlet and said outlet is permitted and a closed position in which flow between said inlet and said outlet is inhibited to connect and disconnect periodically said inlet port and said outlet port and thereby alternately allow and inhibit fluid flow therebetween.

5,485,832
FACE GEAR FOR DIVING AND SWIMMING
Ricardo Joffity, Mail Box No. 7638, Sobradinho-DF-73-001-970, Brazil
Continuation of Ser. No. 922,726, Jul. 31, 1992. This application Mar. 3, 1994, Ser. No. 205,209
Int. Cl.[6] B63C *11/16*
U.S. Cl. 128—201.11 **2 Claims**



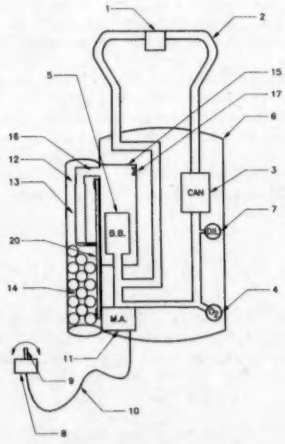
1. A diving face gear comprising:
a face mask having an enclosed nose covering;
a breathing tube connected to an air source;
a mouthpiece connected to said breathing tube;
a wind pipe tube connected to said nose covering and to said mouthpiece; and switching means for selectively allowing or not allowing fluid connection through said wind pipe tube enabling a user either to breath through said mouthpiece and through said nose covering at the same time or to breath exclusively through said mouthpiece avoiding water entrance to said nose covering;
an actuator consisting of a water filled pair of bladders appended to said mouthpiece and designed to fit inside a user's mouth so that a user can depress said bladders with the teeth causing water to be expelled from said bladders or release teeth pressure causing water to enter said bladders;
a pipe connecting said bladders through said mouthpiece to a single external connection tube; and nose clamping means controlled by said actuator.

5,485,833
BREATH EXPOSURE SYNCHRONIZER
Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530
Filed Jun. 10, 1994, Ser. No. 258,568
Int. Cl.[6] A61M *16/00*
U.S. Cl. 128—204.23 **1 Claim**

1. A breath exposure synchronizer for sensing flow during inhalation, exhalation and lack of any breath flow in order to aid a radiographer in properly synchronizing exposure of X-ray film to avoid blurring of radiographs due to voluntary body movement, comprising:
means including a capacitance sensor for sensing a patient's breath flow during inhalation, exhalation and a lack of breath flow;
means including a nasal cannula for applying a patient's breath flow to said capacitance sensor;

said capacitance sensor including a movable pressure responsive vane having opposite sides and a conductive coating on at least one of the sides, the vane being fastened on one side only;
said vane moving in one direction responsive to negative pressure of breath flow being applied thereto during patient inhalation, and moving in another direction responsive to positive pressure of breath flow being applied thereto during exhalation;
said capacitance sensor further including means responsive to sensed patient inhalation and sensed patient exhalation for generating a first visual signal; and means responsive to no breath flow for generating a second visual signal, said visual signals being provided to enable a radiographer to properly synchronize exposure of X-ray film with a patient's respiratory cycles to avoid blurring of radiographs.

5,485,834
MANUALLY TUNABLE, CLOSED-CIRCUIT UNDERWATER BREATHING APPARATUS
Donald D. Joye, Exton, Pa.; William H. Mints, Bowie, Md.; John R. Clarke, Panama City, Fla., and Peter Wechgelaer, Kensington, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 10, 1994, Ser. No. 289,022
Int. Cl.[6] A62B *9/00*
U.S. Cl. 128—205.13 **7 Claims**



1. A manually tunable underwater breathing apparatus (UBA) adapted to recirculate breathing gas from a diver, absorb CO_2, add make-up oxygen, and provide capacitance through a breathing bag, comprising:
(a) a breathing bag contained in a fixed-volume container,

(b) a mechanically, manually adjustable length tube with one end connected to said fixed-volume container and the other end moveable, said adjustable length tube forming the passageway for water to flow into and out of said fixed-volume container,

(c) an actuating means connected to said moveable end of said adjustable length tube, such that length can be changed, and

(d) a user controlled initiating means for activating said actuating means to change length of said adjustable length robe,

wherein said breathing bag undergoes changes in volume from gas being exhaled or inhaled by the diver, thereby displacing water through said tube, the length of said tube giving a characteristic inertance for said UBA; changing the length by said actuating and initiating means changes the inertance and thereby the resonant frequency of said UBA to lessen the breathing load on the diver.

5,485,835

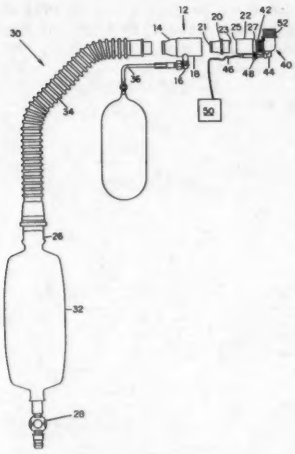
VENTILATION SYSTEM FOR DIAGNOSTIC IMAGING

Penny R. Vande Streek, 4259 Rawhide Rd., Rocklin, Calif. 95677; Tyrone Young, 6602 Munich Rd., San Antonio, Tex. 78256; Frederick L. Weiland, 4950 Keane Dr., Carmichael, Calif. 95608, and Ronald Borchert, 5328 Boulware Ct., Charlotte, N.C. 28277

Filed Oct. 14, 1994, Ser. No. 323,082

Int. Cl.[6] A61M *36/04*

U.S. Cl. 128—205.13 **22 Claims**



1. An adaptor for attachment to a ventilation bag for delivering radioactive gas and oxygen to the lungs of a patient for the purpose of diagnostic imaging and for recovering said gas, wherein said adaptor comprises:

a three-legged connector having a first leg for attachment to a first flexible tubing of a ventilation bag, a second leg for attachment to a second flexible tubing connected to an oxygen source and a third leg;

a one-way valve having an inlet end and an outlet end, wherein said inlet end of said one-way valve is attached to said third leg of said three-legged connector; and

a dose chamber having a first end and a second end, wherein said first end of said dose chamber is attached to said outlet end of said one-way valve and said second end of said dose chamber is an outlet from said adaptor, said dose chamber being made of a composition having self-sealing properties.

5,485,836

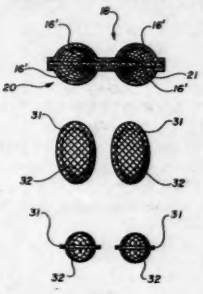
NOSE WORN AIR FILTER

Robert A. Lincoln, 8325 Murphy Rd., Laurel, Md. 20707

Division of Ser. No. 174,393, Mar. 28, 1988, Pat. No. 4,984,302, and a continuation-in-part of Ser. No. 28,702, Mar. 20, 1987, abandoned. This application Dec. 6, 1990, Ser. No. 605,348

Int. Cl.[6] A62B *23/06*

U.S. Cl. 128—206.11 **7 Claims**



1. A nose filter, comprising:

dome shaped filtering material defining individual dome shaped air filtering devices, each said device having an elliptical base and being sized to match an opening of nostril at the base of a nose and having an outer surface; and

an air impervious collar extending radially from said outer surface and extending completely around a perimeter of each said device at said elliptical base of each said device, each said collar being sized to extend laterally beyond said outer surface of the respective device such that said collars will form seals around said air filtering devices thereby preventing air from passing therearound.

5,485,837

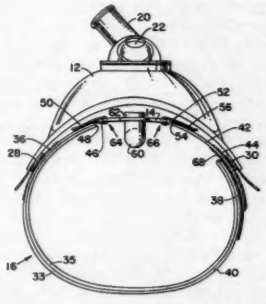
STRAP FOR COMBINING TRACHEOTOMY TUBE AND MOIST AIR MASK

Angela M. Solesbee, and Irene D. Hebert, both of 6 Bethany Woods Dr., Asheville, N.C. 28805

Filed Nov. 23, 1993, Ser. No. 157,388

Int. Cl.[6] A61M *16/00;* **A62B** *9/06*

U.S. Cl. 128—207.17 **1 Claim**



1. A tracheotomy tube and moist air mask combination comprising a base plate, and a strap arrangement wherein said strap arrangement is adapted to extend about the neck of a patient and having two ends, said base plate being connected between said two ends of said strap arrangement, said base plate having a central hole that receives said tracheotomy tube that extends out of a patient's trachea, said combination further comprising means for permitting attachment and removal of said moist air mask to said

strap arrangement without removal of said strap arrangement or disconnection of said base plate from either said strap arrangement or said tracheotomy tube, said means comprising a first pair of connection members disposed on said strap arrangement on opposing sides of said base plate, and a second pair of connection members on opposing sides of said mask, said first and second pair of connecting members being engageable and disengageable to connect said mask to said single strap arrangement and place said masks over said base plate and tracheotomy tube, and to allow removal of said mask for patient maintenance, respectively.

5,485,838

NON-INVASIVE BLOOD PRESSURE MEASUREMENT DEVICE

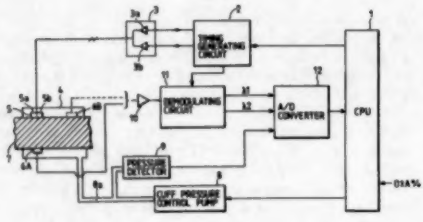
Teiji Ukawa, and Tatsuo Yoshida, both of Tokyo, Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Filed Dec. 7, 1993, Ser. No. 162,254

Claims priority, application Japan, Dec. 7, 1992, 4-326632; Dec. 7, 1992, 4-326633

Int. Cl.[6] A61B 5/00

U.S. Cl. 128—633 **2 Claims**



1. A non-invasive blood pressure measurement device comprising:

a cuff configured to be attached to a body part of a subject;

a pressure detector operatively connected to said cuff for detecting a cuff pressure applied to the body part by the cuff and outputting a detection output;

pressure applying means for applying pressure to the cuff in response to an input pressure increase control signal and for dropping the cuff pressure in response to an input pressure decrease control signal;

a light-emitting member for injecting beams of light of two different wavelengths, one being a beam of red light and the other being a beam of infrared light, into the body part of the subject to which pressure is applied by said cuff;

a light-receiving member for detecting one of amounts of light transmitted and amounts of light reflected of the beams of light injected into the body part from said light-emitting member, and thereby outputting light-receiving signals for the two different wavelengths;

signal component separating means operatively connected to said light-receiving member for separating a dc component and a pulsatile component from each of the light-receiving signals of the respective wavelengths obtained from said light-receiving member;

oxygen saturation calculating means for calculating a ratio of a pulsation component in absorption of one wavelength due to arterial blood flow to that of the other wavelength from the dc components and the pulsatile components of the respective wavelengths obtained from said signal component separating means, and for calculating an oxygen saturation from the ratio;

permissible range of variance calculating means for obtaining a mean value of oxygen saturation measurements of the subject before said pressure applying means applies pressure to the cuff, and for calculating a permissible range of variance from the mean value, the oxygen saturation measurements being obtained from said oxygen saturation calculating means;

cuff pressure control means for outputting the pressure increase control signal to said pressure applying means while receiving the detection output from said pressure detector, and for outputting the pressure decrease control signals, for dropping the once increased cuff pressure, to said pressure applying means, after the permissible range of variance has been obtained;

determining means for determining whether or not an oxygen saturation obtained in the course of increasing or decreasing the cuff pressure is within the permissible range of variance and for outputting a determination result; and

blood pressure measuring means for selecting, based on the determination result output by said determining means, a valid pulse wave signal from the pulsatile components obtained by said signal component separating means in the course of increasing or decreasing the cuff pressure and for calculating a blood pressure value of the subject by a volume oscillometric method from an amplitude of the valid pulse wave signal and the detection output obtained from said pressure detector.

5,485,839

METHOD AND APPARATUS FOR ULTRASONIC WAVE MEDICAL TREATMENT USING COMPUTED TOMOGRAPHY

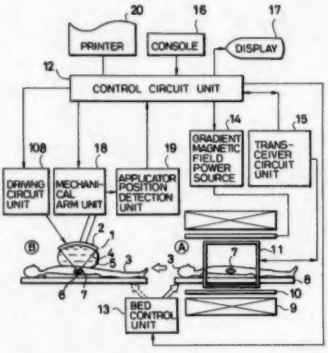
Satoshi Aida, Tokyo; Mariko Shibata; Katsuhiko Fujimoto, both of Kanagawa; Yoshiharu Ishibashi, Tokyo; Takuji Suzuki, Kanagawa; Kozo Sato, Kanagawa, and Ayao Itoh, Kanagawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 22,911, Feb. 26, 1993, abandoned. This application Sep. 2, 1994, Ser. No. 300,199

Claims priority, application Japan, Feb. 28, 1992, 4-043603; Sep. 11, 1992, 4-242886

Int. Cl.[6] A61B 6/00

U.S. Cl. 128—653.1 **20 Claims**



1. An ultrasonic medical treatment apparatus, comprising:

ultrasonic wave applicator means for applying ultrasonic waves to an object to be treated;

non-ultrasonic computed tomography means for obtaining three-dimensional image information of the object to be treated;

focal point control means for changing a position of a focal point of the ultrasonic waves applied by the ultrasonic wave applicator means without changing a view field of the computed tomography means;

calculating means for determining the position of the focal point changed by the focal point control means in the three-dimensional image information obtained by the computed tomography means; and

display means for displaying the three-dimensional image information obtained by the computed tomography means in

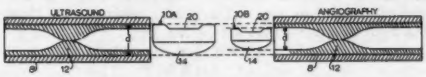
superposition with the focal point at the position determined by the calculation means.

5,485,840

METHOD OF PRECISE GUIDANCE FOR DIRECTIONAL ATHERECTOMY USING ULTRASOUND

Robert P. Bauman, 211 Kirkwood Dr., Chapel Hill, N.C. 27514

Filed Mar. 15, 1994, Ser. No. 213,216
Int. Cl.[6] A61B *8/12*
U.S. Cl. 128—660.03 **12 Claims**



1. A method of performing atherectomy on plaque material at a site within a vessel utilizing a directional atherectomy catheter with a cutter which has a marker which is visualizable with fluoroscopy utilizing an X-ray beam, and which may be used to direct cuts; and an ultrasonic imaging apparatus, said method comprising:

(a) positioning the catheter cutter with fluoroscopy in the vessel such that the directional marker is perpendicular to the X-ray beam;

(b) making an initial reference cut in the plaque material in the vessel;

(c) utilizing the ultrasonic imaging apparatus to locate the initial reference cut to orient the distribution of plaque with respect to the visualized position of the fluoroscopically visualizable directional marker on the cutter window so that subsequent cuts made with the cutter result in plaque removal in a first area having a predetermined spatial relationship to the initial reference cut;

(d) performing a first series of organized cuts of said plaque in said first area, said series of organized cuts comprising one or more passes with the cutter in said first area;

(e) ultrasonically visualizing said vessel to determine the remaining location of plaque after said first series of organized cuts;

(f) performing additional cuts in said first area followed by repetition of step (e) until a desired amount of plaque has been removed in said first area;

(g) performing cuts of said plaque at an additional chosen area of said site, said additional chosen area having a predetermined spatial relationship to the initial reference cut and to the first series of organized cuts;

(h) ultrasonically visualizing said vessel to determine the location of residual plaque after said additional cuts; and

(i) performing additional cuts in said additional chosen area followed by repetition of step (h) until a predetermined desired amount of plaque has been removed from said additional chosen area.

5,485,841

ULTRASONIC LUNG TISSUE ASSESSMENT

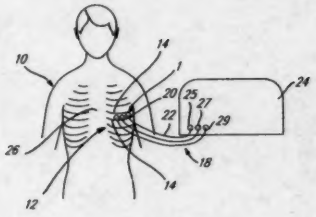
Kenneth L. Watkin, 258 Hollis Road, Beaconsfield, Quebec, Canada, and Peter T. Macklem, 3470 Redpath, #207, Montreal, Quebec, Canada

Filed Feb. 14, 1995, Ser. No. 388,302
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—660.01 **10 Claims**

1. A non-invasive diagnostic method for determining the state of lung tissue housed in a chest cavity of a living subject comprising:

transmitting ultrasonic radiation from an ultrasonic source disposed externally of an external chest wall of the chest cavity, through the chest wall and into the lung tissue, during breathing by the subject,

receiving reflected ultrasonic radiation, reflected dynamically by airspaces in the tissue, and



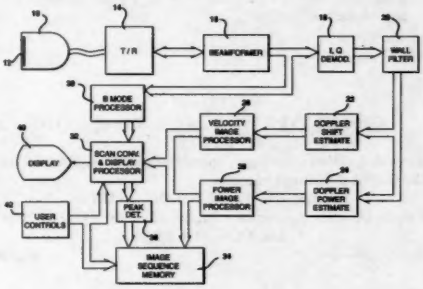
developing a signal from the reflected ultrasonic radiation as a dynamic real-time measure of parameters of the airspaces indicative of the state of the lung tissue.

5,485,842

ULTRASONIC DIAGNOSTIC SCAN CONVERSION FOR THREE DIMENSIONAL DISPLAY PROCESSING

Jens U. Quistgaard, Seattle, Wash., assignor to Advanced Technology Laboratories, Inc., Bothell, Wash.

Filed Nov. 30, 1994, Ser. No. 347,028
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—66.07 **24 Claims**



1. A method for producing a perspective view of a volumetric region of the body from a plurality of spatially related planar ultrasonic sector images comprising the steps of:

receiving a plurality of spatially related ultrasonic sector images from said volumetric region;

identifying the angle of said perspective view in relation to a reference plane;

processing each image by a) scaling one or more of the dimensions of said image in proportion to said perspective viewing angle, and b) translating the image in the plane of the image in proportion to the spacing between said spatially related planes and said perspective viewing angle;

combining said processed images to form a composite perspective view image; and

displaying said perspective view image.

5,485,843

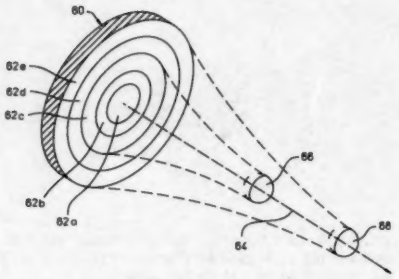
ACOUSTIC ARRAYS AND METHODS FOR SENSING FLUID FLOW

Michael Greenstein, Los Altos; Hewlett E. Melton, Jr., Sunnyvale, and King-Wah W. Yeung, Cupertino, all of Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Aug. 9, 1993, Ser. No. 104,510
Int. Cl.[6] A61B *8/06*
U.S. Cl. 128—661.09 **17 Claims**

1. A system for measuring blood flow within a blood vessel or organ comprising:

A. an array of piezoelectric transducer elements;



B. signal generation, sensing, and conditioning means:

1. for electronically grouping the transducer elements into a pattern of concentric active aperture regions;
2. for individually and repeatedly applying to the transducer elements in each active aperture region a corresponding pulsed electrical transmit signal to generate a substantially isotropic and spherical ultrasonic interrogation volume within which blood flow is to be measured; and
3. for sensing an ultrasonic return signal that is back-scattered from particles within the interrogation volume; and

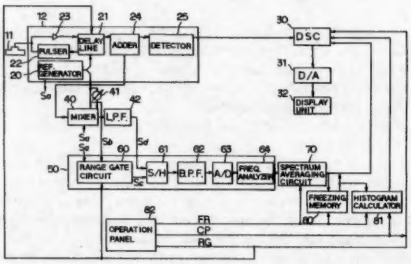
C. processing means for calculating an estimate of a predetermined characteristic of blood flow as a predetermined function of the return signal.

5,485,844

DOPPLER-TYPE ULTRASONIC DIAGNOSTIC APPARATUS

Takanobu Uchibori, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed May 17, 1994, Ser. No. 243,874
Claims priority, application Japan, May 18, 1993, 5-115897
Int. Cl.[6] A61B *8/06*
U.S. Cl. 128—661.09 **19 Claims**



1. A Doppler-type ultrasonic diagnostic apparatus, in which a diagnostic portion of an object being examined is scanned by an ultrasonic beam signal, said diagnostic portion including a fluid such as blood in motion, the apparatus comprising:

means for transmitting the ultrasonic beam signal into the diagnostic portion and receiving an ultrasonic echo signal reflected by the diagnostic portion;

means for converting the ultrasonic echo signal into a corresponding electrical echo signal;

means for extracting a Doppler signal from the electrical echo signal, said the Doppler signal being formed by the fluid;

means for calculating data of a Doppler spectrum consisting of a plurality of instantaneous spectra each including a plurality of Doppler frequency components from the extracted Doppler signal, said Doppler spectrum having two dimensions consisting of a time dimension and a Doppler shift frequency dimension corresponding to a flow speed of the fluid;

means for smoothing the data of the Doppler spectrum in accordance with a speckle duration corresponding to a width of the ultrasonic beam signal; and

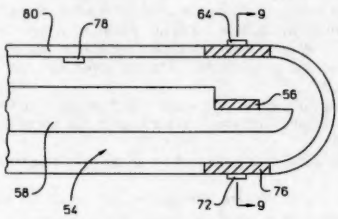
means for displaying the smoothed data of the Doppler spectrum.

5,485,845

ROTARY ENCODER FOR INTRAVASCULAR ULTRASOUND CATHETER

Edward Verdonk, Redwood City; Michael Greenstein, Los Altos; Hewlett E. Melton, Jr., Sunnyvale, and Mir S. Seyed-Bolorforosh, Palo Alto, all of Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed May 4, 1995, Ser. No. 434,616
Int. Cl.[6] A61B *8/12*
U.S. Cl. 128—662.06 **22 Claims**



1. An ultrasound device for obtaining an image of an interior of a vessel comprising:

probe means for entering a body, said probe means having a proximal end and a distal end;

signal means for radiating a rotary pattern of ultrasonic energy from said distal end and for receiving reflected ultrasonic energy;

position-identification means for individually identifying a plurality of directions of radiation within said rotary pattern, said position-identification means including a plurality of beacons fixed within said rotary pattern to direct ultrasonic energy toward said signal means; and

adaptive means, operatively associated with said position-identification means, for compensating for variations in angular velocity of said radiating said rotary pattern by said signal means, wherein said adaptive means reduces image distortions due to nonuniform angular velocity of said radiating.

5,485,846

AUTOMATED LONGITUDINAL POSITION TRANSLATOR FOR ULTRASONIC IMAGING PROBES, AND METHODS OF USING SAME

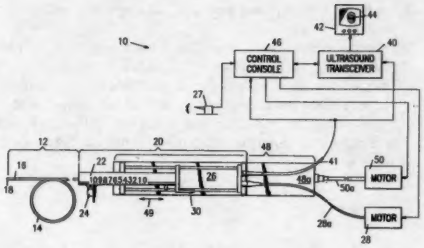
William E. Webler, Costa Mesa, and Mark S. Buhr, Newport Beach, both of Calif., assignors to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 906,311, Jun. 30, 1992, Pat. No. 5,361,768. This application Aug. 4, 1994, Ser. No. 285,969
Int. Cl.[6] A61B *8/12*
U.S. Cl. 128—662.06 **4 Claims**

1. An automated longitudinal position translator for ultrasonic imaging probes having a distally located ultrasound transducer subassembly comprising:

a probe drive module adapted to being operatively coupled to the imaging probe so as to allow for longitudinal shifting of the ultrasound transducer subassembly of the probe between spaced-apart positions;

a motor-driven linear translation module connectable to said probe drive module to effect motor-driven longitudinal translation of said probe drive module to thereby responsively longitudinally shift said ultra sound transducer subassembly; and



a foot-activated switch electrically connected to said motor-driven linear translation module to selectively control the amount of said motor-driven longitudinal translation of said probe drive module when said switch is activated.

5,485,847

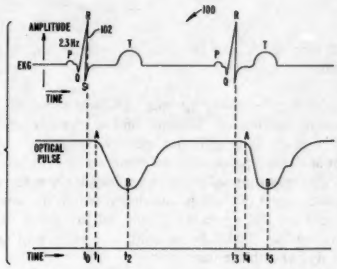
PULSE OXIMETER USING A VIRTUAL TRIGGER FOR HEART RATE SYNCHRONIZATION

Clark R. Baker, Jr., Castro Valley, Calif., assignor to Nellcor Puritan Bennett Incorporated, Pleasanton, Calif.

Filed Oct. 8, 1993, Ser. No. 134,572

Int. Cl.[6] A61B *5/02*

U.S. Cl. 128—666 **28 Claims**



1. An apparatus comprising:

means for generating a first signal from a periodic physical activity;

means for generating a second signal having a first frequency corresponding to said periodic physical activity;

means for generating a virtual trigger having said first frequency, said virtual trigger being generated independent of any feature of said second signal other than said first frequency; and

means for processing said first signal in periods defined by said virtual trigger.

5,485,848

PORTABLE BLOOD PRESSURE MEASURING DEVICE AND METHOD OF MEASURING BLOOD PRESSURE

Sandra R. Jackson, and Harry E. Jackson, both of 424 W. End Ave., Apt. 11B, New York, N.Y. 10024

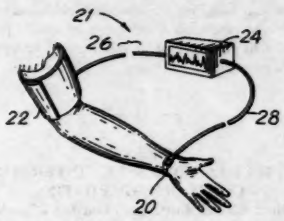
Continuation-in-part of Ser. No. 648,882, Jan. 31, 1991, abandoned. This application Jun. 4, 1992, Ser. No. 893,287

Int. Cl.[6] A61B *5/021*

U.S. Cl. 128—672 **87 Claims**

1. A method of blood pressure monitoring, comprising the steps of:

mounting a transducer on a user's body so that it detects at least one of spatial displacement and pressure variations caused by blood flow through an artery;



mounting a blood pressure measuring device which provides accurate and diagnostically meaningful blood pressure results on a user's body;

collecting calibration data for the transducer while so mounted by comparing a transducer output signal with an output from said blood pressure measuring device;

determining a base pressure applied to the transducer by the step of mounting the transducer to maintain substantially constant pressure on the transducer within a predetermined range of values;

disconnecting said blood pressure measuring device from the user's body;

after disconnecting said blood pressure measuring device, measuring the output signals of the mounted transducer; and

computing blood pressure from at least said measured transducer output signals and said calibration data.

5,485,849

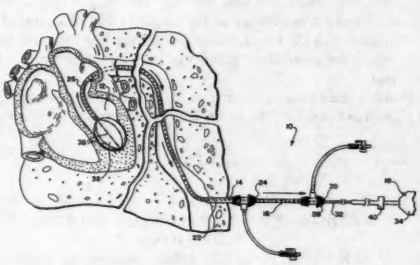
SYSTEM AND METHODS FOR MATCHING ELECTRICAL CHARACTERISTICS AND PROPAGATION VELOCITIES IN CARDIAC TISSUE

Dorin Panescu, Sunnyvale, and David K. Swanson, Mountain View, both of Calif., assignors to EP Technologies, Inc., Sunnyvale, Calif.

Filed Jan. 31, 1994, Ser. No. 189,445

Int. Cl.[6] A61C *5/04*

U.S. Cl. 128—699 **19 Claims**



1. A system for examining heart tissue comprising

at least three spaced apart electrodes,

locating means for positioning at least two of the electrodes in contact with a heart tissue region,

first means for transmitting electrical current in a first path through the heart tissue region between a first pair of the electrodes, for transmitting electrical current in a second path through the heart tissue region between a second pair of the electrodes, and for deriving therefrom tissue electrical characteristics based, at least in part, upon sensing impedances of tissue lying in the first and second paths,

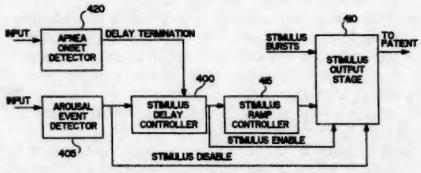
second means for sensing timing of local depolarization events in the tissue in which impedance is sensed and for deriving therefrom propagation velocities of the sensed depolarization events, and

third means for matching derived tissue electrical characteristics with derived propagation velocities in spatial relation to the electrodes to characterize morphology of heart tissue in the heart tissue region.

5,485,850
MONITOR OF LOW PRESSURE INTERVALS WITH CONTROL CAPABILITIES
Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530
Filed Aug. 13, 1993, Ser. No. 106,083
Int. Cl.[6] A61B *5/08; A61M 16/00*
U.S. Cl. 128—716 **2 Claims**

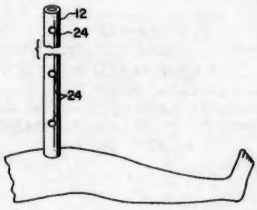
1. An apparatus for monitoring low pressure intervals and controlling delivery of therapeutic gas to be synchronous with inhalation comprising:
a) a source of therapeutic gas;
b) means for delivering the therapeutic gas from the source to nasal cavities of an air breathing animal;
c) sensing means, connected to the means for delivering, for generating a signal indicative of a change in pressure produced at a beginning of inhalation of the air breathing animal, said sensing means including a vane;
d) processing means for receiving the signal and determining a length of inhalation of the animal, said processing means including circuit means for determining a dose of the therapeutic gas to be delivered to the animal, the circuit means including means for automatically adjusting a length of the dose to be a percentage of the length of the inhalation of the animal with the length of the dose never less than 200 mS;
e) means for controlling delivery of the dose of therapeutic gas; and
f) alarm means for generating an alarm when the sensing means does not generate the signal for a predetermined time period.

5,485,851
METHOD AND APPARATUS FOR AROUSAL DETECTION
Donald J. Erickson, Plymouth, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Sep. 21, 1994, Ser. No. 310,125
Int. Cl.[6] A61B *5/08*
U.S. Cl. 128—716 **32 Claims**



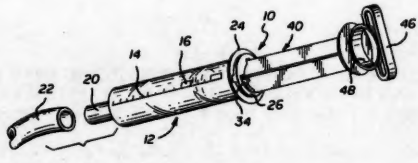
1. A method for detecting arousal from sleep in a patient by the steps of:
(a) sensing a signal characteristic of respiratory effort of the patient;
(b) sampling the sensed signal at a predetermined interval to provide a digitized respiratory effort waveform;
(c) monitoring the digitized signal for at least one parameter of the waveform indicating a body movement artifact; and
(d) comparing at least one value for the parameter with a predetermined limit to determine whether the patient is aroused.

5,485,852
PAIN TOLERANCE TESTING DEVICE
Lanny L. Johnson, 2950 E. Mount Hope Rd., Okemos, Mich. 48864
Filed Dec. 12, 1994, Ser. No. 354,786
Int. Cl.[6] A61B *19/00*
U.S. Cl. 128—744 **8 Claims**



1. A device adapted to be used for medical testing purposes, comprising:
a ball;
a cylindrical tube having an inner diameter substantially corresponding to that of said ball and a plurality of apertures spaced along its length, said apertures having diameters substantially corresponding to the diameter of said ball; and
means for supporting said tube in a substantially upright position whereby when the ball is introduced within the tube through any one of said apertures, it will fall by gravity towards a lower end of said tube to impact a body part positioned directly beneath the tube.

5,485,853
APPARATUS FOR WITHDRAWING FLUID OR TISSUE FROM A PATIENT'S BODY
George Stubbs, 8978 Wonderland Park Ave., Los Angeles, Calif. 90046
Filed Apr. 28, 1994, Ser. No. 233,413
Int. Cl.[6] A61B *10/00*
U.S. Cl. 128—752 **21 Claims**



1. In combination,
a hollow tube,
a collar fixedly disposed on the tube and having an inner periphery and having slots extending radially outwardly from its inner periphery at annularly spaced positions around its inner periphery,
stops disposed on the collar and extending in an axial direction,

ramps extending from the collar to the stops, and

a piston disposed within the hollow tube for axial movement within the tube and extending axially from the tube and having radially disposed splines disposed in cooperative relationship with the radially disposed slots in the collar to provide for an axial movement of the piston within the tube when the splines are aligned with the slots in the collar,

the splines being grooved to provide for a rotational movement of the piston on the ramps, with the grooves in the piston splines axially aligned with the collar, to dispose the splines against the stops in the collar for a locking relationship, between the collar and the splines.

5,485,854

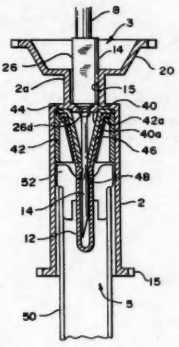
SAFETY BLOOD COLLECTION TUBE HOLDER AND ASSEMBLY THEREFOR

William H. Hollister, Nelson, N.H., assignor to Smiths Industries Medical Systems, Inc., Keene, N.H.

Filed Apr. 12, 1994, Ser. No. 226,466

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—763 **15 Claims**



1. A blood collection safety apparatus comprising:

a tube holder having a first and second end for accepting a cannula of a blood collecting device and blood collection robes each sealed with an elastomer, respectively, said first end of said tube holder having a protective shield extending therearound;

an elastic tubular sheath fixedly retained and aligned within said tube holder, said sheath having an open end and a closed pierceable end fixedly located relative to said first and second end of said robe, respectively;

wherein when a cannula is inserted to said first end of said tube holder, at least the tip of said cannula passes through said open end of said sheath so as to be enveloped by said sheath; and

wherein when a blood collection robe is inserted to said second end of said tube holder, said elastomer of said collection tube slidably pushes back said closed end of said sheath so that said closed end and said elastomer are pierced by the tip of said cannula and a fluid communication path is effected from said blood collection tube to said cannula.

5,485,855

INSTRUMENT FOR MEASURING BREAST SHAPE

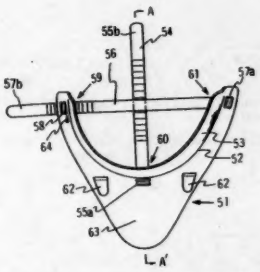
Norinobu Shiraiwa, Shiga, and Tatsuya Kusakabe, Kyoto, both of, Japan, assignors to Wacoal Corp., Kyoto, Japan

Filed Mar. 14, 1994, Ser. No. 209,409

Claims priority, application Japan, Mar. 16, 1993, 5-011223 U

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—774 **19 Claims**



1. An instrument for measuring breast shape comprising:

a base member having first and second free ends which are joined by a substantially half-circular edge part which is to be applied along a verg's line of a breast which is a circular arc underneath each breast;

a vertical tape measure having a predetermined graduation for measuring a vertical length of the breast between a nipple and a verg's line of the breast, having a first end which is fixed on the base member at a position in the vicinity of a lowest position of the substantially half-circular edge part;

a horizontal tape measure having a predetermined graduation for measuring a horizontal length of the breast across the nipple, having a first end which is fixed on the base member at a position in the vicinity of one of the first and second free ends of the base member.

5,485,856

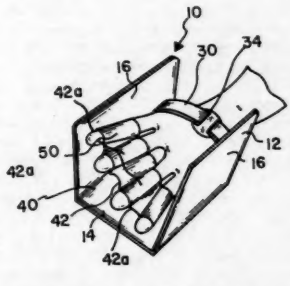
HAND IMMOBILIGING AND POSITIONING APPARATUS FOR X-RAY EXAMINATIONS

Peter E. Buckland, 17835 NW. 63rd Ct., Miami, Fla. 33015

Filed Apr. 22, 1994, Ser. No. 231,235

Int. Cl.[6] A61G *15/00*; **A61F** *5/37*

U.S. Cl. 128—845 **5 Claims**



1. An apparatus for positioning and immobilizing the hand and fingers of a patient, wherein said fingers comprise all fingers other than the thumb, for antero-posterior and lateral X-ray examination of said selected finger, comprising:

means for supporting having a supporting surface for supporting the back of a hand and a selected finger of said hand,

a finger directing member having an abutting end for abutting said support surface and an opposing stepped end having a plurality of step portions for each supporting one of said fingers, such that said steps are each at position laterally distinct from all other said steps and wherein said steps are of sufficient size and are sufficiently staggered to spread said fingers sufficiently to isolate all said fingers on said steps for lateral X-ray examination.

5,485,857

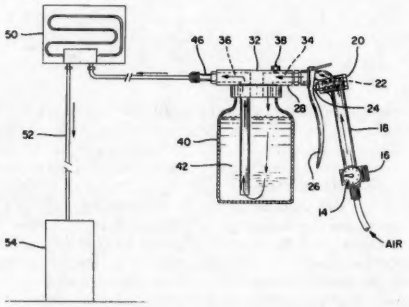
AUTOMATIC TRANSMISSION COOLER FLUSHING DEVICE

Thomas L. Amundsen, 1100 E. Streamwood Blvd., Streamwood, Ill. 60107

Filed Jun. 8, 1994, Ser. No. 255,461

Int. Cl.[6] B08B *9/02*

U.S. Cl. 134—102.2 **20 Claims**



17. In a system for flushing an automobile transmission cooler, the improvement of the system including a hand held portable transmission cooler flushing apparatus for flushing an automobile transmission cooler, cleaning solvent and pressured air means, the hand held portable transmission cooler flushing apparatus comprising a liquid spray gun, said liquid spray gun being connected to a hose, said liquid spray gun comprising an air inlet plug fitting attachment, a handle, said handle having an open passageway through the length of the handle, said handle having an air inlet and an air outlet at opposite ends of the open passageway, said air inlet plug fitting attachment being connected to the air inlet of the handle, an air valve, said air valve being connected near the air outlet to the handle, said air valve having an air passageway that can be opened and closed, said air valve containing a compression spring that acts to keep the air passageway closed, an air valve button, said air valve button being connected at one end of the air valve so that when the air valve button is pressed the air passageway within the air valve is then opened and when the air valve button is released then said compression spring acts to close said air valve passageway within the air valve, a trigger, said trigger being loosely connected about a top end of the handle, said trigger being positioned in such a way that when the trigger is pulled while holding said handle, the trigger then pushes the air valve button into the air valve opening the air passageway within the air valve, a lid structure including a lower lid portion and an upper air and liquid transfer housing portion, a canister for holding said cleaning solvent, said canister having an open end, said canister being covered by the lid structure at said open end in an air tight assembly, said lid structure having an angular high pressure air passageway and an angular high pressure liquid passageway, said angular high pressure air passageway having an entrance in the upper air and liquid transfer housing portion and an exit in the lower lid portion, said entrance of the angular high pressure air passageway being connected to the air outlet of the handle, said exit of the lid air inlet tube being exposed to an inside of the canister, said angular high pressure liquid passageway having an entrance in the lower lid portion and an exit in the upper air and liquid transfer housing portion, said entrance of the angular high pressure liquid passageway being exposed to an inside of the canister, said exit of the angular high pressure liquid passageway being exposed outside of the canister, a pressure tube, said pressure tube being hollow, said pressure tube being attached to the entrance of angular high pressure liquid passageway and extending downwardly to a bottom of the canister for transportation of the cleaning solvent in the canister, and a nozzle, said nozzle being attached to the exit of the angular high pressure liquid passageway, said hose being attached to the nozzle whereby when the liquid spray gun is attached to the pressured air means at the air inlet plug fitting attachment and the hose is attached to one opening of a transmission cooler, said cleaning solvent can be passed through the hose hydraulically in a stream from the liquid spray gun by air pressure from the pressured air means into and through the transmission cooler and out a second opening of the transmission cooler by pulling the trigger to clean and check the flow of the automobile transmission cooler said trigger also enabling a pulsating action of said cleaning solvent through the transmission cooler to provide additional cleaning action in removing stubborn debris, after said cleaning solvent has been forced out of the canister in a stream a further cleaning action can then be performed by forcing pressurized air through the canister and into the transmission cooler, the pressurized air that is passed through the canister mixes with a residue of the cleaning solvent remaining in the canister thereby providing an atomized cleaning action in addition to flushing the transmission cooler with the hydraulic stream of the cleaning solvent.

5,485,858

METHOD OF AND APPARATUS FOR CLEANING OBJECTS OF PLASTICS PROCESSING MACHINES

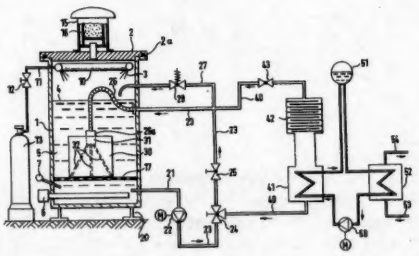
Rudolf Schmidt, München, Germany, assignor to Caroline Christ Abgasfreie Werkzeugreinigungsapparate für die Kunststoffindustrie, Munich, Germany

Filed Jan. 24, 1994, Ser. No. 187,303

Claims priority, application Germany, Jan. 28, 1993, 43 02 415.7

Int. Cl.[6] B08B *3/10*

U.S. Cl. 134—107 **27 Claims**



20. Apparatus for removing plastic residues from objects of plastics processing machines to which plastic residues adhere; said apparatus comprising:

a closed container defining a treatment chamber for receiving an object to be cleaned, said treatment chamber being filled with a liquid heat transfer fluid;

heating means for raising the temperature of the heat transfer fluid to a level exceeding a melting or decomposition temperature of the plastic residues;

pump means arranged outside said treatment chamber and connected to said treatment chamber via a pressure conduit for circulating heat transfer fluid, said pressure conduit terminating in a hose which projects into said treatment chamber and has a mouth piece securable in a position pointing in direction of the object to be cleaned;

a three-way valve arranged in said pressure conduit;

a bypass connected to one outlet port of said three-way valve;

a filter arranged in said bypass for separating removed residues from the heat transfer fluid; and

a throttle or pressure reducing valve arranged in said pressure conduit between said three-way valve and a junction with said bypass.

5,485,859

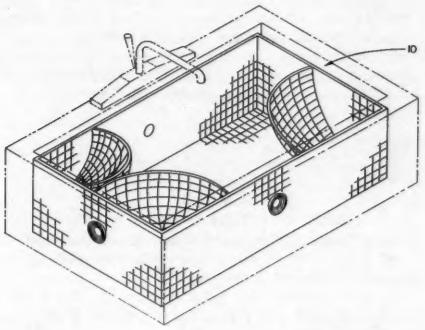
DISHWASHING AID FOR THE HANDICAPPED

Charles D. Johnson, 701 E. Tantallon Dr., Fort Washington, Md. 20744, and Debra Johnson, 909 Watson St. #1B, Baltimore, Md. 21202

Filed Sep. 29, 1994, Ser. No. 314,809

Int. Cl.[6] B08B *13/00*

U.S. Cl. 134—115 R **2 Claims**



1. A new and improved dishwashing aid for allowing a handicapped or physically unable person to wash dishes without frustration comprising, in combination:

a rectangular plastic mesh container having four side walls, a closed bottom, an open top, an inner surface, and an outer surface, a plurality of apertures formed in the four side walls with at least one aperture formed in each of the four side walls, the rectangular container functioning to fit inside of a sink;

a plurality of mesh holding chambers, each holding chamber having a closed bottom, an open top, and a curved sidewall therebetween, the curved sidewall being tapered from the open top to the closed bottom, the curved sidewall having a first end and a second end, the first end integral with the inner surface of one of the four side walls, the second end integral with the inner surface of one of the four side walls adjacent, the holding chambers functioning to hold dishes and pans loosely in place for the user;

a plurality of suction cups, each of the suction cups having an extension, each extension coupled to the outer surface of the rectangular plastic mesh container through one of the plurality of apertures formed therein by a fastening means, the suction cups functioning to secure the rectangular container inside of a sink.

5,485,860

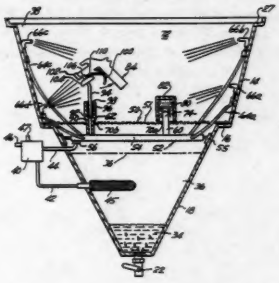
SPRAY GUN AND ASSOCIATE PARTS WASHER AND RECYCLER

Richard A. Robb, West Bloomfield, Mich.; Michael J. Grubb, London, Canada; John J. Grubb, Calgary, Canada, and James T. Asanger, Carstairs, Canada, assignors to Herkules Equiptment Corp., Walled Lake, Mich.

Division of Ser. No. 362,611, Jun. 7, 1989, Pat. No. 5,174,317, which is a division of Ser. No. 288,466, Dec. 22, 1988, abandoned, which is a continuation of Ser. No. 904,097, Sep. 5, 1986, Pat. No. 4,793,369. This application Sep. 28, 1992, Ser. No. 952,644

Int. Cl.[6] B08B *3/02*

U.S. Cl. 134—166 C **6 Claims**



1. In a paint removal system which includes a housing within which a paint gun is temporally held for removing paint from the paint gun, which paint gun has an outwardly extending paint supply tube through which paint normally flows into the gun for painting, the improvement comprising:

a support member arranged within the housing and having an end portion which is temporarily connectable to, for holding a free, open lower end of the paint supply tube so that the paint gun is substantially supported upon the support member by its paint supply tube;

the support member having a passageway extending through it and through which solvent is flowed;

the support member passageway communicating with the open, lower end of the paint supply tube for flowing solvent through the tube and, therefore, through the gun;

whereby the support member delivers solvent to the gun, while holding the gun, so that no additional support means is needed for holding the gun in its supported position during the passage of the solvent through the gun for cleaning the gun.

5,485,861

CLEANING TANK

Yutaka Hiratsuka, and Tadashi Akiyama, both of Yokohama, Japan, assignors to Dan Science Co., Ltd., Tokyo, Japan

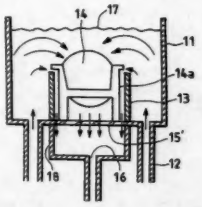
Filed Oct. 4, 1994, Ser. No. 317,351

Claims priority, application Japan, Jan. 19, 1993, 5-260505

Int. Cl.[6] B08B *11/00*

U.S. Cl. 134—182 **14 Claims**

1. A cleaning tank defining therein a cleaning chamber having a



width, a length and a height adapted to receive an article to be cleaned and having an upper opening for carrying the article into and out of the cleaning chamber, a plurality of small holes provided in a bottom wall of the cleaning chamber, an outlet port communicated with the small holes, and at least one inlet port provided in the bottom portion of the cleaning tank and outside of the cleaning chamber for introducing a cleaning liquid into the cleaning tank and to the upper opening of the cleaning chamber.

5,485,862

CANE TIP

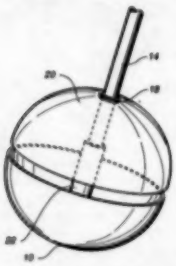
Melvin Kahn, 467 Central Ave., Alameda, Calif. 94501

Continuation-in-part of Ser. No. 86,613, Jul. 2, 1993, Pat. No. 5,301,703. This application Apr. 8, 1994, Ser. No. 224,855

The portion of the term of this patent subsequent to Jul. 2, 2013, has been disclaimed.

Int. Cl.[6] **A45B** *9/04*

U.S. Cl. 135—77 **4 Claims**



1. A tip for a cane for use by the visually handicapped wherein said cane has a shank and said shank has a bottom end, said tip comprising

a contact element including a contact shell having an outwardly facing convex contact surface and a hollow interior region behind said contact surface, said contact surface being relatively broad in relation to the diameter of the bottom end of a shank of a cane to which it is attached, and having a substantially continuous curvature for substantially its entire breath, and said contact element further including a reflector shell having a hollow interior region, said reflector shell being adapted for positioning on the shank of a cane in spaced relation behind said contact shell such that the hollow interior regions of said contact shell and reflector shell face each other to provide a reverberation region between said shells, and

means for rigidly attaching said contact element to the bottom end of a shank of a cane such that the contact surface of said contact element acts as a fixed tip of said cane to which it is attached.

5,485,863

COLLAPSIBLE SHELTER WITH ELEVATED CANOPY

Mark C. Carter, 10131 Kernwood Ct., Alta Loma, Calif. 91737

Continuation-in-part of Ser. No. 42,996, Apr. 5, 1993. This application Jul. 25, 1994, Ser. No. 279,656

Int. Cl.[6] **E04H** *15/50*

U.S. Cl. 135—145 **10 Claims**

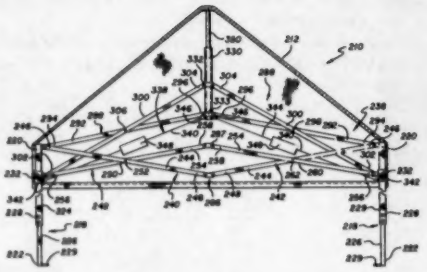
1. A collapsible shelter, comprising:

a canopy having at least three sides and at least three corners;

at least three vertically disposed legs supporting said canopy, with one of said legs disposed under each of said canopy corners, each of said legs having an upper end and a lower end;

at least two perimeter truss pairs of link members connected to each of said legs, each of said perimeter truss pairs of link members including first and second link members, said first link member having an outer end connected to the upper end of one said leg, and said second link member having an outer end slidably connected to said leg, and said first and second link members being pivotally connected together in a scissors configuration so as to be extendable from a first collapsed position to a second extended position extending above said leg; and

at least two central truss pairs of link members, each said central truss pairs of link members including first and second link members connected together in a scissors configuration, each of said central truss pairs being connected to the inner ends of at least one said perimeter truss pair, said first and second link members being pivotally connected together in a scissors configuration so as to be extendable from a first collapsed position to a second extended position, said second links of the central truss pairs being longer than the first links of the central truss pairs, so that in said second extended position of the shelter, the second link extends above the upper ends of the legs.



5,485,864

PRESSURE COMPENSATION VALVE

Masamitsu Takeuchi; Kazuyoshi Ishihama, and Kazunori Ikei, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Komatsu Siesakusho, Tokyo, Japan

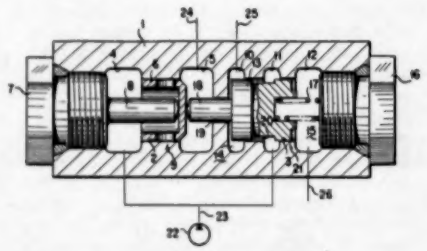
PCT No. PCT/JP93/00724, § 371 Date Nov. 23, 1994, § 102(e) Date Nov. 23, 1994, PCT Pub. No. WO93/24756, PCT Pub. Date Sep. 12, 1993

PCT Filed May 28, 1993, Ser. No. 347,437

Claims priority, application Japan, May 28, 1992, 4-42200 U

Int. Cl.[6] **F15B** *11/05;11/16*

U.S. Cl. 137—118 **9 Claims**



1. A pressure compensation valve comprising:

a valve body defining therein an inlet port and an outlet port, first, second and third ports, a first pressure chamber communicating with said first port, and a second pressure chamber communicating with said third port;

a check valve portion provided in said valve body and including a check valve for establishing and blocking communication between said inlet port and said outlet port; and

a pressure reduction valve provided in said valve body, said pressure reduction valve including a spool establishing com-

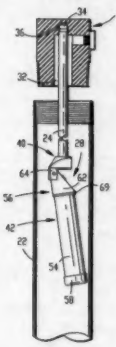
munication between said second port and said third port when a predetermined pressure is generated in said first pressure chamber and blocking communication between said second port and said third port when a predetermined pressure is generated in said second pressure chamber, and said pressure reduction valve also including a spring biasing said spool to a position at which said spool will block communication between said second port and said third port while contacting said check valve.

5,485,865

AIR VOLUME CONTROL VALVE FOR WATER SYSTEM PRESSURE TANK

Thomas N. Shirk, Beatrice, Nebr., assignor to Dempster Industries, Inc., Beatrice, Nebr.

Filed Nov. 1, 1994, Ser. No. 333,022
Int. Cl.[6] F16K *31/18*
U.S. Cl. 137—209 **12 Claims**



1. An air volume control valve apparatus for use with a water system pressure tank, the apparatus comprising:

an elongated tubular drop tube presenting first and second axial ends and a passage through the tube;

a support means for supporting the drop tube on the tank with the first end of the tube exposed to an area exterior of the tank and the second end of the tube disposed within the tank;

a seat member secured to the second end of the drop tube, the seat member closing off the passage at the second axial end of the drop tube except for a restricted passageway in the seat member, and including a lower surface through which the restricted passageway extends, the seat member including an annular seat surrounding the restricted passageway and protruding from the lower surface; and

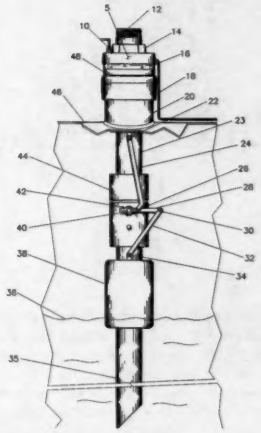
an elongated float member having a first axial end supported for pivoting movement on the seat member about a pivot axis extending in a direction transverse to the length of the tube, and a second free end opposite the first end, the float member being buoyant in water so that as the water level rises in the tank beyond the predetermined level, the float member is lifted on the water to an upper pivoted position in which the float member, engages the seat, closing off the restricted passageway, and when the water level drops beneath the predetermined level, the float member pivots to a lowered position in which the restricted passageway is uncovered, the float member being provided with a patch of relatively resilient material that bears against the annular seat of the seat member when the float member is in the upper pivoted position, sealing the restricted orifice.

5,485,866

FLUID SHUT OFF VALVE AND FILL LEVEL INDIDCATION

James H. Bowen, 12190 Richland Dr., Catharpin, Va. 22018

Division of Ser. No. 166,932, Dec. 15, 1993, Pat. No. 5,427,137. This application Apr. 13, 1995, Ser. No. 421,242
Int. Cl.[6] H16K *37/00;31/24;33/00*
U.S. Cl. 137—554 **8 Claims**



5. A valve to cutoff flow and to monitor different fluid level conditions in a storage tank while said tank is being filled comprising in combination:

a valve means to cutoff an incoming flow of fluid when said storage tank that is being filled is at a full level condition;

a float to contact and follow different fill levels of said fluid as said fluid rises in said storage tank;

an actuator to actuate said valve means by the movement of said float;

a first switch disposed above said valve to be connected to a monitoring system to indicate a full condition of said storage tank;

said actuator actuates said first switch by the movement of said float as said fluid rises within said storage tank;

a linkage that connects said float to said actuator;

a second switch disposed above said valve that actuates prior to said first switch, said second switch to be connected to said monitoring system to indicate a near full condition; and

said actuator actuates said second switch by the movement of said float in said storage tank.

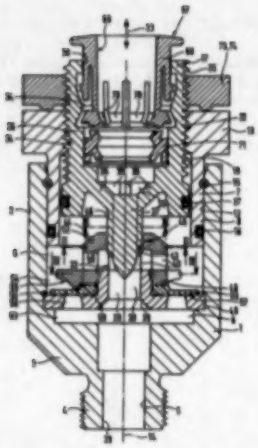
5,485,867

CHOKE VALVE

Kurt Stoll, Esslingen, Germany, assignor to Festo KG, Esslingen, Germany

Filed May 26, 1994, Ser. No. 249,814
Claims priority, application Germany, May 27, 1993, 43 17 604.6
Int. Cl.[6] F16K *47/04*
U.S. Cl. 137—599 **13 Claims**

1. A choke valve comprising a housing wherein a choke duct extends to be in communication with two connection ports arranged coaxially in relation to one another and at opposite ends of the housing for the supply and/or removal of a driving fluid and a choke member arranged on the housing to cooperate with the choke duct and able to be set by being moved in two opposite directions for altering the flow aperture thereof in a setting direction in relation to the housing, wherein one of the connection ports is provided on the choke member, the connection port being directed in the setting direction and the connection port on the



choke member communicating with the choke duct which extends through the choke member, wherein at least one of the connection ports comprises a plug connection device for detachable connection to a fluid power hose, and wherein the choke member comprises a housing of a plug connection device in the form of a gripping ferrule which is able to be freely turned in relation to the choke member, the...plug connection housing being provided in a duct portion associated with the choke member and being able to be actuated externally on the plug connection housing.

5,485,868

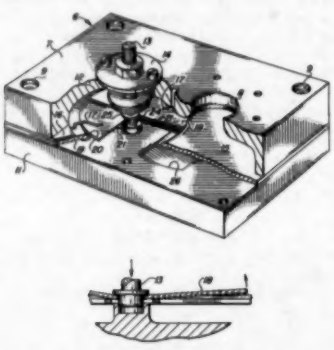
FAST ACTING HIGH OUTPUT VALVE

Link C. Jaw, Tempe, and Frank O. Liu, Chandler, both of Ariz., assignors to Scientific Monitoring, Inc., Tempe, Ariz.

Filed Sep. 13, 1994, Ser. No. 305,018

Int. Cl.[6] F16K *1/24;31/44*

U.S. Cl. 137—601 **9 Claims**



1. A fast-acting high-output valve suitable to control flow of a fluid through an opening, said valve comprised of

a valve body in a geometric shape similar to that of said opening, said valve body containing a center and a periphery, and said valve body comprised of a plurality of individual pieces;

a means for applying a force to the center of said valve body;

a means for transforming said force at the center of said valve body to an opposite motion at the periphery of said valve body; and

a means for guiding said individual pieces as said force at the center of said valve body is transformed to an opposite motion at the periphery of said valve body, said means capable of preventing said individual pieces from shifting laterally over one another.

5,485,869

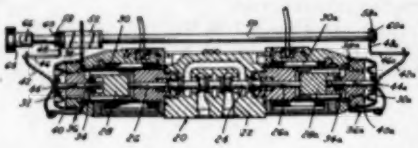
HYDRAULIC DUAL SOLENOID DIRECTIONAL CONTROL VALVE WITH MANUAL OVERRIDE LOCK-OUT LINKAGE

Ronald L. Haynes, Searcy, Ark., assignor to Vickers, Incorporated, Maumee, Ohio

Filed Dec. 30, 1993, Ser. No. 175,955

Int. Cl.[6] F15B *13/01;13/044*

U.S. Cl. 137—625.65 **5 Claims**



1. A hydraulic solenoid directional control valve comprising

a valve body,

a valve spool controlling inlet and outlet ports,

a coil at each end,

an armature associated with each coil,

push pin means associated with each armature,

a hinge member fixed to the coil at each end,

a lever mechanically hinged to each hinge member,

an elbow member mechanically hinged to said lever,

a common rod,

each said elbow member having an opening,

said openings being aligned,

said rod extending through said openings,

a sleeve on one end of said rod,

said sleeve having a polygonal cross section,

mechanical means non-rotatably connecting said sleeve to said rod and holding said sleeve against movement relative to said rod,

said hinge member at said one end of said rod having a polygonal opening complementary to the cross section of said sleeve through which said sleeve normally extends such that when the rod is moved in one direction and rotated, the sleeve and rod are moved such that an interference fit is provided at a plurality of positions as the sleeve and rod are rotated relative to the opening such that rotation between the sleeve and the projection on one hinge member causes the lever to yieldingly apply force to the push pin means of the corresponding solenoid actuating the valve in one direction, and

when the rod is actuated in the opposite direction and then rotated after clearing the sleeve from the opening in the hinge member, the sleeve provides an interference fit with the other side of the hinge member at one end such that the lever on the other end of the valve is actuated to apply a force to the other push pin means and hold the push pin means in position having shifted the spool of the valve in the opposite direction.

5,485,870

WIRE WRAPPED COMPOSITE SPIRAL HOSE AND METHOD

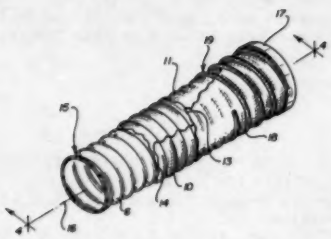
Newell P. Kraik, 10 Harrowby Crt., Islington, Ontario, Canada

Filed Dec. 5, 1994, Ser. No. 349,205

Int. Cl.[6] F16L *11/10*

U.S. Cl. 138—122 **15 Claims**

1. A composite hose, comprising a preformed plastic hose base structure having an exterior surface comprising a spiral convolu-



tion formed therein; a plurality of layers of fabric enveloping said convoluted exterior surface of said base structure; a wire, wrapped along said spiral convolution and engaging and distending said plurality of layers of fabric against said plastic hose base; means for retaining an end of said wire to said hose; said wire engaging said fabric within said spiral convolution of said base structure.

5,485,871

FILLER HEAD FOR A MOTOR VEHICLE FUEL TANK FILING PIPE

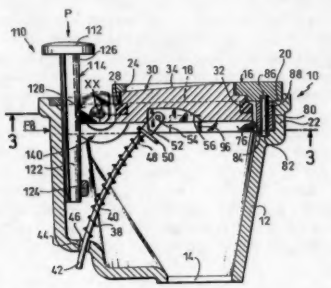
Christian Romanek, Noailles, and Christophe Crepin, Pontoise, both of, France, assignors to Oaul Journee, S.A., Reilly, France

Continuation of Ser. No. 311,152, Sep. 23, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 479,551

Claims priority, application France, Sep. 29, 1993, 93 11579

Int. Cl.[6] B65D *55/00*

U.S. Cl. 141—312 **7 Claims**



1. A filler head for a motor vehicle fuel tank filling pipe, comprising a bowl-shaped body having an upper face defining a filling orifice, a shut-off flap valve, pivot means mounting the shut-off valve to the body, for pivoting movement of said valve between a rest position in which the valve closes the filling orifice and a withdrawn position in which it lies within said body and wherein the filling orifice is then open; first resilient means carried in said body and connected to the shut-off valve for biassing the latter towards said rest position, whereby introduction of a filling nozzle through the filling orifice moves the shut-off valve to its withdrawn position against the action of the first resilient means; and automatic locking means in the body, comprising an unlocking control member and means for coupling the unlocking control member with the shut-off valve whereby to lock the latter in its rest position, wherein: the shut-off valve defines a lower face thereof; the body defines a seating around the filling orifice whereby said first resilient means urges the shut-off valve into engagement against said seating; the locking means comprises: at least one locking finger; a portion of said lower face of the shut-off valve adapted for receiving said at least one locking finger; second resilient means for urging the latter into engagement with said portion of the lower face of the valve so as to define a locking position; and means for moving the locking finger or fingers from said locking position to an unlocking position in which the locking finger is, or fingers are, laterally retracted from said portion of the lower face of the flap valve; wherein the automatic locking means comprise a locking arm having a first end portion, a second end portion, and a middle portion joining said first and second end portions, the said middle portion having a said locking finger, second end portion defining a control surface, the shut-off valve having a side edge, said body having an upper face for surrounding said side edge of the shut-off valve in the rest position of the edge of the latter, the body defining a pivot axis at right angles to its said upper face, the filler head further comprising means articulating a first end portion of a pivot arm to the body for pivoting of the locking arm about said axis, with said control member defining a control cam cooperating with said control surface of the locking arm.

5,485,872

DEVICE FOR CLOSING A NON-REFILLABLE BOTTLE, AND ADAPTORS FOR FILLING AND DRAINING THROUGH SUCH A DEVICE

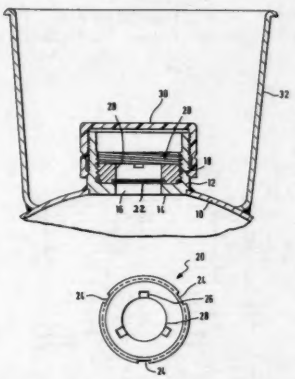
Leon Kerger, Helmdange, Luxembourg, assignor to Luxembourg Patent Company S.A., Luxembourg

Filed Jul. 12, 1994, Ser. No. 273,636

Claims priority, application Luxembourg, Jul. 12, 1993, 88378

Int. Cl.[6] B65B *1/04;3/04*

U.S. Cl. 141—329 **14 Claims**



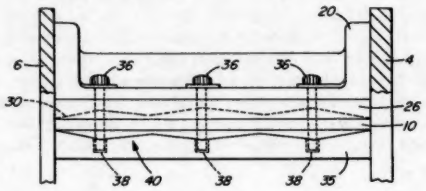
1. Device for closing a non-refillable bottle, characterized by a tubular coupling (**12**) designed to be rendered integral with the wall of the bottle and exhibiting, at its base, an internal annular shoulder (**14**) which defines an opening (**16**) for filling and draining the bottle, via a cylindrical ring (**20**) closed by a membrane (**22**), the external diameter of said ring (**20**) being larger than the diameter of the said opening (**16**), in that part of the external surface of said ring (**20**) has an external diameter corresponding to the internal diameter of the coupling (**12**), in that at least the middle part of the internal surface of the coupling (**12**) and the said part of the external surface of the ring (**20**) are equipped with sets of internal and external screw threads, respectively, and in that at least one longitudinal groove (**24**) passes through one of said sets of screw threads to allow fluid to flow into said bottle when said ring (**20**) is loosely screwed into said coupling (**12**).

5,485,873

KNIFE CLAMPING SYSTEM

Patrick J. Crammond, Coquitlam, Canada, assignor to CAE Machinery Ltd., Canada

Filed Aug. 9, 1994, Ser. No. 287,662
Int. Cl.[6] B27C *1/00*
U.S. Cl. 144—162 R **15 Claims**



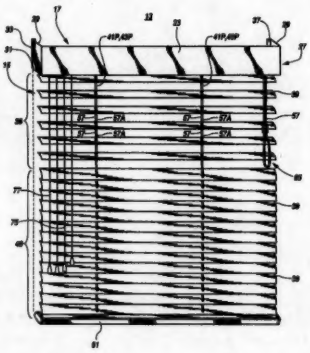
1. In an apparatus for processing wood having:
a rotatable support;
a cutter;
at least one holding location on the rotatable support to receive the cutter;
a clamp to engage and hold the cutter in position at the at least one holding location; and
a surface formed on at least one of the clamp and the at least one holding location having an undulating profile engageable against the cutter, the at least one surface being shaped to deform to engage the cutter with a substantially uniform clamping load upon securing of the fastener with a pre-selected force.

5,485,874

VENETIAN BLIND

William F. Whitmore, 3452 Osborn Dr., Modesta, Calif. 95350

Filed Apr. 18, 1994, Ser. No. 229,163
Int. Cl.[6] E06B *3/48*
U.S. Cl. 160—115 **10 Claims**



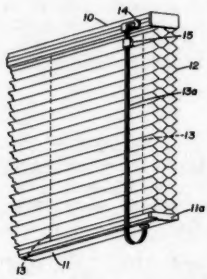
1. A venetian blind, comprising:
a control housing;
a first array of slats suspended from the control housing;
a second array of slats suspended from the control housing below the first array of slats;
a lifting cord for raising and lowering the slats;
a first set of control cords for opening and closing the first array of slats, including a proximate control cord and a distal control cord;
a second set of control cords for opening and closing the second array of slats, including a proximate control cord and a distal control cord;
holding means for holding the two proximate control cords adjacent to one another and for holding the two distal control cords adjacent to one another as the slats in the first array are raised.

5,485,875

WINDOW SHADE WITH BREAK-AWAY ATTACHMENT OF LIFT CORDS TO BOTTOM RAIL

John R. Genova, Madison, Wis., assignor to Springs Window Fashions Division, Inc.

Filed Mar. 31, 1994, Ser. No. 220,663
Int. Cl.[6] E06B *9/30*
U.S. Cl. 160—168.1 **5 Claims**



1. A window shade assembly comprising a header, a bottom rail and expansible and contractable shade means attached to the header and bottom rail, bottom rail operating means including at least two lift cords attached to the bottom rail and extending upwardly to the header and through cord lock means on the header, the bottom rail operating means including at least one operating portion extending downwardly from the cord lock means and manually operable for moving the bottom rail between upper and lower positions, the operating portion having a length sufficient to extend below the lower rail when the latter is in said lower position thereof, a cord end member on a lower end of the operation portion, and means detachably mounting the cord end member on the bottom rail, the detachable mounting means being constructed and arranged to allow the cord end member to detach from the mounting means on the bottom rail when the associated operating portion is subjected to a tensile force in a direction away from the bottom rail.

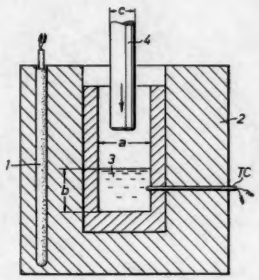
5,485,876

PROCESS FOR PRODUCING METAL MATERIAL WITH EXCELLENT MECHANICAL PROPERTIES

Hiroyuki Horimura, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1993, Ser. No. 83,832
Claims priority, application Japan, Jun. 30, 1992, 4-172658
Int. Cl.[6] B22D *7/10*
U.S. Cl. 164—122 **20 Claims**

1. A process for producing a metal material with excellent mechanical properties, comprising the steps of:
producing a metal having a melting temperature (Tm) and a glass transition temperature (Tg);
placing the metal in a supercooled liquid state by setting the temperature (T) of the metal in a range of $Tg \leqq T \leqq Tm$;
causing the supercooled liquid metal, which is included in a container and has a basic form defined by the shape of the container, to flow into a second container so that the form of the supercooled liquid is changed to a second form defined by the second container, thereby increasing the temperature of the supercooled liquid;



allowing the temperature of the supercooled liquid metal of a changed form to become uniform, thereby inhibiting the production of non-uniform crystal nuclei; and

thereafter subjecting said supercooled liquid of a changed form to a cooling treatment to solidify said supercooled liquid.

5,485,877

ROTARY REGENERATIVE HEAT EXCHANGER

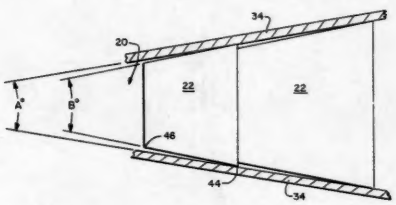
Mark E. Brophy, Wellsville, N.Y., assignor to ABB Air Preheater, Inc., Wellsville, N.Y.

Filed Oct. 28, 1994, Ser. No. 330,923

Int. Cl.[6] F23L *15/02*

U.S. Cl. 165—8 **4 Claims**

1. A rotor assembly for a vertical shift rotary regenerative heat



exchanger, said rotor assembly having a center portion, a top and a bottom and mounted on an axially extending rotor shaft and comprising:

a) a cylindrical outer rotor shell;

b) diaphragm plates extending radially in said rotor assembly essentially from said center portion thereof to said outer rotor shell and from said top to said bottom thereof so as to divide said rotor into a plurality of sector-shaped compartments, said diaphragm plates being at a selected angle to each other;

c) a plurality of axially spaced horizontally extending support gratings located in each sector-shaped compartment mounted between said diaphragms, said support gratings being of an open structure to permit fluid flow axially therethrough;

d) a plurality of truncated sector-shaped heat exchange baskets supported on each support grating radially adjacent to each other and extending generally from said center portion to said outer rotor shell, each of said baskets being constructed to have a sector shape with an included angle is greater than said selected angle of said sector-shaped compartment.

5,485,878

MODULAR AIR CONDITIONING SYSTEM

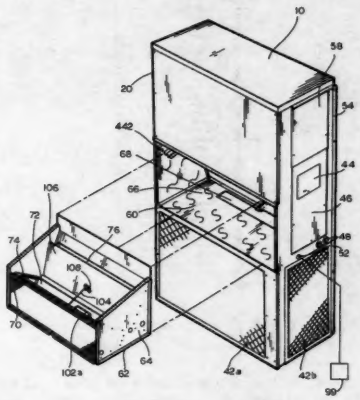
Irvin L. Derks, Bryan, Ohio, assignor to Bard Manufacturing Company, Bryan, Ohio

Continuation-in-part of Ser. No. 16,153, Feb. 5, 1993, Pat. No. 5,301,744. This application Mar. 23, 1994, Ser. No. 216,334

The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.

Int. Cl.[6] F25B *29/00*

U.S. Cl. 165—16 **29 Claims**



1. In a heating, ventilation, and air conditioning (HVAC) system attachable to a structure, said structure having an interior and an exterior, said air conditioning system, comprising:

a) an elongate housing including;

1) a module receiving chamber inside said housing in communication externally and internally of said housing;

2) a return air opening in said housing in communication with said chamber and with said interior;

3) an air inlet opening in said housing in communication with said chamber and with said exterior;

4) an air exhaust duct in said housing in communication with said chamber and with said exterior for exhausting air from said interior to said exterior;

5) an air supply duct in said housing having a first end in communication with said chamber and a second end in communication with said interior to provide a conduit for passage of conditioned air from said ventilation system to said interior;

6) a ventilation module removably fastenable within said chamber, said ventilation module containing a damper for routing air through said return air opening, said air inlet opening, said air supply duct, and said air exhaust duct;

7) means for conditioning air within said air supply duct;

8) means for circulating air mounted in said air supply duct for drawing fresh air through said air inlet opening and said return air opening, through said chamber, through said air conditioning means, and out said second end of said air supply duct into said interior;

b) temperature responsive means; and,

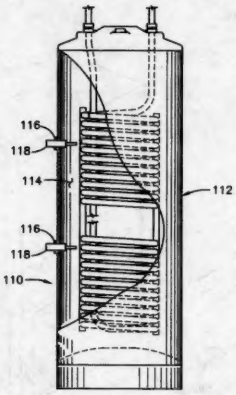
c) means for controlling said air circulating means and said conditioning air means, said control means receiving and processing signals from said temperature responsive means located in said structure or in said return air opening.

5,485,879

COMBINED WATER HEATER AND HEAT EXCHANGER

Eric M. Lannes, Kentwood, Mich., assignor to Bradford White Corporation, Ambler, Pa.

Continuation-in-part of Ser. No. 84,406, Jun. 29, 1993, Pat. No. 5,372,185. This application Apr. 8, 1994, Ser. No. 225,177
The portion of the term of this patent subsequent to Dec. 13, 2011, has been disclaimed.
Int. Cl.[6] F24D *3/08*; F28F *11/00*
U.S. Cl. 165—70 **24 Claims**



1. A system for heating a domestic water supply and a separate recirculating fluid supply for recirculation to a heating system, said heating system comprising:

a water storage tank adapted to contain said domestic water supply, said water storage tank having a top, a bottom, and a wall;

a heat source positioned to heat said domestic water supply within said water storage tank;

a tube connected to contain said recirculating fluid supply, said tube being mounted within said water storage tank in communication with the exterior of said water storage tank, said tube having a double-wall construction with a non-metallic outer wall in contact with a metallic inner wall, said double-wall preventing the mixing of said domestic water and said recirculating fluid; and

a means for sealing between said tube and said tank and preventing the mixing of said domestic water supply and said recirculating fluid supply.

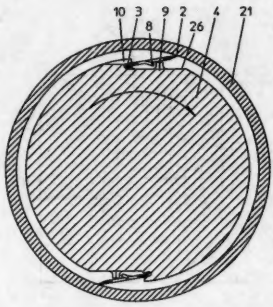
5,485,880

BLADE SYSTEM FOR A SCRAPED SURFACE HEAT EXCHANGER

Klas Zeuthen, Frederiksberg C, Denmark, assignor to Gerstenberg & Agger A/S, Frederiksberg C, Denmark

Continuation of Ser. No. 140,527, Oct. 25, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 412,201
Claims priority, application Denmark, Jan. 29, 1992, 1323/92
Int. Cl.[6] F25C *1/14*
U.S. Cl. 165—94 **9 Claims**

1. A scraped surface heat exchanger comprising cylindrical wall means for defining an elongated inner treatment chamber through which a material to be treated can flow, said wall means providing an inner surface facing the treatment chamber; an elongated rotor rotatably mounted within said treatment chamber, said rotor defining a peripheral outer surface and mounting a first abutment means and a second abutment means spaced from the first abutment means, said second abutment means comprising a pin which extends away from the peripheral outer surface; and an elongated scraper blade positioned between the rotor and the cylindrical wall means, said scraper blade providing a longitudinal base which



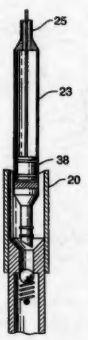
abuts said first abutment means when the rotor is rotated in one direction, and an opposite longitudinal knife edge which is positionable against the inner surface of the cylindrical wall means to scrape said inner surface when the rotor is rotated in said one direction, said scraper blade also including a flap which extends towards said rotor to abut said second abutment means when the rotor is rotated in an opposite, second direction, said scraper blade being removable from the treatment chamber without removal of the rotor by gripping an end thereof and sliding said scraper blade in a longitudinal direction thereof.

5,485,881

GROUNDWATER SAMPLER

Donald A. Toon, Burlington, Canada; Per H. Nielsen, Copenhagen, and Bent Skov, Hedehusene, both of, Denmark, assignors to Solinst Canada Limited, Georgetown, Canada

Filed May 4, 1994, Ser. No. 237,893
Claims priority, application United Kingdom, May 4, 1993, 9309205
Int. Cl.[6] E21B *49/08*
U.S. Cl. 166—165 **11 Claims**



1. System for accessing liquid in a borehole, comprising: a lowerable structure; a push/pull structure; and a down-hole fixture, wherein:

the lowerable structure is lowerable into, and removable from, the bore-hole;

the push/pull structure extends, when the lowerable structure is in the borehole, from the lowerable structure up to the ground surface;

the push/pull structure is attached to the lowerable structure, and comprises a means by which the lowerable structure may, from the surface, be raised and lowered in the bore-hole;

the push/pull structure has such structural rigidity, and is of such a nature that a downwards pushing force may be transmitted therethrough from the surface to the lowerable structure,

whereby the lowerable structure, when in the borehole, may be forcefully pushed downwards and moved downwards by a force exerted at the ground surface;

the lowerable structure includes a lowerable-structure passageway which is so arranged that a sample of the liquid may be transferred therethrough;

the lowerable structure includes a means for closing the lowerable-structure passageway, when the lowerable structure is being raised in the borehole;

the down-hole fixture remains in the borehole, and open to the liquid surrounding the bore-hole;

the down-hole fixture includes a down-hole passageway leading into the borehole;

the down-hole fixture includes a mechanically-operable check-valve, which is effective normally to hold the down-hole passageway closed, but which, when operated, is effective to hold the down-hole passageway open;

the lowerable structure includes a means for mechanically operating the check-valve, which is effective to operate the check-valve when the lowerable structure is being pushed down, by the push/pull structure, into mechanical engagement with the down-hole fixture,

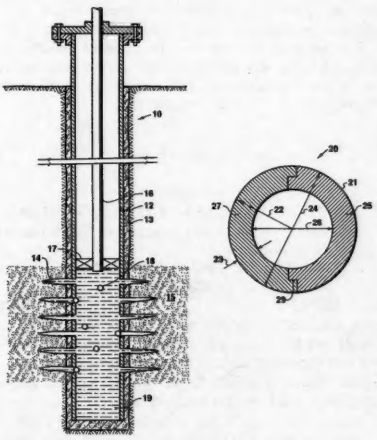
the lowerable structure is engageable mechanically with the down-hole fixture, the nature of the engagement being such that, when so engaged, the passageways are in communication, whereby water may pass via the lowerable-structure passageway and the down-hole passageway between the down-hole fixture and the lowerable structure.

5,485,882

LOW-DENSITY BALL SEALER FOR USE AS A DIVERTING AGENT IN HOSTILE ENVIRONMENT WELLS

James R. Bailey, Missouri City, and Larry E. Harrison, Houston, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 27, 1994, Ser. No. 329,937
Int. Cl.[6] E21B *33/138;33/10;43/27;43/25*
U.S. Cl. 166—284 **22 Claims**



1. A method of treating a subterranean formation surrounding a cased wellbore wherein the casing has an interval provided with a plurality of perforations, said method comprising:

(a) flowing down said casing to said perforated interval a plurality of ball sealers suspended in a treating fluid, each of said ball sealers having a density less than the density of said treating fluid, in the range of about 0.8 g/cc to about 1.3 g/cc, and being sized to substantially seal said perforations; each of said ball sealers further comprised of a spherical shell formed by two halves, said first half having a mating member designed to sealably engage with the mating member of the second half; and wherein the ratio of the spherical shell outer radius to the spherical shell thickness is less than 10; and

(b) continuing the flow of said liquid until said ball sealers seal at least a portion of said perforations.

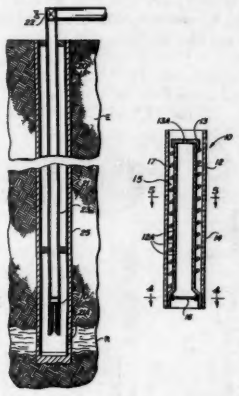
9. A ball sealer for plugging a passage formed through a vessel; said ball sealer being sized to substantially seal said passage and being comprised of a spherical shell having first and second halves designed to sealably engage, wherein the ratio of the spherical shell outer radius to the spherical shell thickness is less than 10, said ball sealer further having a density in the range of about 0.5 g/cc to about 1.3 g/cc, and said spherical shell comprised of a high-strength material.

5,485,883

METHOD AND APPARATUS TO ENHANCE THE RECOVERY OF CRUDE OIL

William W. Rippetoe, Bixby, and David N. Shroff, Broken Arrow, both of Okla., assignors to Universal Enrivonmental Technologies, Inc., Naples, Fla.

Filed Apr. 17, 1995, Ser. No. 423,024
Int. Cl.[6] E21B *37/06;41/02;43/00*
U.S. Cl. 166—369 **6 Claims**



1. Apparatus for enhancing the recovery of crude oil from an oil well having a string of tubing in the well which extends to the level of the underground reservoir of crude oil comprising

a device attached to the lower end of the tubing in the oil well and positioned so that the device lies at the level of the reservoir of crude oil,

said device consisting of two spaced apart cylindrical metal tubes having a common vertical axis,

the innermost cylindrical tube having an open lower end, a capped upper end and a multiplicity of radially bored spaced apart holes in the wall of the inner tube,

the outer cylindrical tube having its lower end joined to the lower end of the inner tube and its upper end remaining open,

the inner tube being made of an alloy of pure copper and pure nickel in which the copper comprises at least 80% of the alloy, and

the outer tube having its entire interior surface made of an alloy of pure copper and pure nickel in which the copper comprises at least 80% of the alloy.

3. A method of enhancing the recovery of crude oil from an oil well having a string of tubing in the well which extends to the level of the underground reservoir of crude oil comprising

attaching a device to the lower end of the tubing in the oil well, said device consisting of two spaced apart cylindrical metal tubes having a common vertical axis,

the innermost cylindrical tube having an open lower end, a capped upper end and a multiplicity of radially bored spaced apart holes in the wall of the inner tube,

the outer tube having its lower end joined to the lower end of the inner tube and its upper end remaining open,

the inner tube being made of an alloy of pure copper and pure nickel in which the copper comprises at least 80% of the alloy,

the outer tube having its entire interior surface made of an alloy of pure copper and pure nickel in which the copper comprises at lest 80% of the alloy, and

using the oil reservoir pressure to draw the crude oil into the open lower end of the device and into the interior of the inner tube causing a multiplicity of streams or jets of crude oil to issue from the radially bored holes in the wall of the innermost tube to bombard the copper and nickel walls of the annular chamber between the two tubes of the device whereby electrons freed from the copper in the walls of the chamber combine with molecules of the crude oil itself and with the molecules of the paraffins and other ingredients entrained in the crude oil to alter certain physical characteristics of the crude oil and its entrained ingredients.

5,485,884

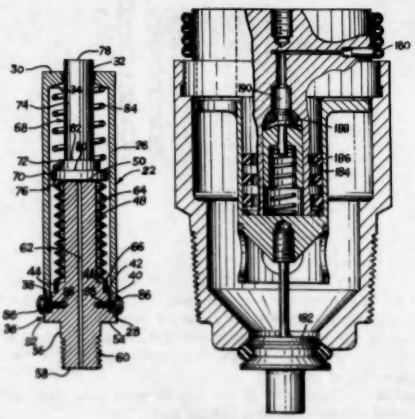
HYDRIDE OPERATED REVERSIBLE TEMPERATURE RESPONSIVE ACTUATOR AND DEVICE

David J. Hanley, Bergenfield, N.J.; E. Lee Huston, Tuxedo, and P. Mark Golben, Florida, both of N.Y., assignors to Ergenics, Inc., Ringwood, N.J.

Continuation of Ser. No. 371,092, Jun. 26, 1989, abandoned. This application Feb. 20, 1991, Ser. No. 658,427

Int. Cl.[6] A62C *35/08*

U.S. Cl. 169—19 **2 Claims**



1. An actuator for repeatedly performing a function at a predetermined temperature, said actuator comprising an actuator assembly including an expandable element comprised of a bellows having a closed end, and means outside said expandable element for reversibly liberating hydrogen gas into a sealed system defined in part by said expandable element, said means for liberating hydrogen gas comprising hydride sensor assembly including an outer tube containing tubular means porous to the passage of hydrogen gas and spaced from the inner wall of said outer tube and providing a hydrogen gas passage, and hydriding alloy powder between said outer tube and said tubular means, said outer tube having a closed sealed end and an open end in hydrogen gas communication with the interior of said bellows, so that when the temperature of said powder rises to a predetermined value, desorption of said powder suddenly liberates hydrogen gas into said hydrogen gas passage, internally pressurizing said bellows to a predetermined value, said hydrogen gas passage having a check valve and flow restrictor positioned therein to provide time delay control for shutoff of the hydride sensor.

5,485,885

DOZING SYSTEM FOR A BULLDOZER

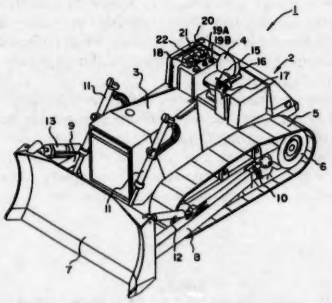
Shigenori Matsushita; Shu H. Zhang; Shigeru Yamamoto; Satoru Nishita, and Kazushi Nakata, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 25, 1994, Ser. No. 249,235

Claims priority, application Japan, May 31, 1993, 5-129369

Int. Cl.[6] A01B *63/112*

U.S. Cl. 172—7 **13 Claims**



1. A dozing system for a bulldozer comprising:

(a) actual tractive force detector means for detecting an actual tractive force of a vehicle body;

(b) target tractive force setting means for setting a target tractive force for the vehicle body;

(c) tractive force deviation calculator means for calculating a deviation between the actual tractive force detected by the actual tractive force detector means and the target tractive force set by the target tractive force setting means; and

(d) comparison control means for controlling a blade to be lifted or lowered such that the absolute value of the deviation is increased, when at least the absolute value of the deviation is less than a first preset value and the actual tractive force is approaching the target tractive force.

5,485,886

ADJUSTABLE AGRICULTURAL TOOL HOLDER

James H. Bassett, Sycamore, Ill., assignor to Dawn Equipment Company, Sycamore, Ill.

Filed Dec. 9, 1993, Ser. No. 164,153

Int. Cl.[6] A01B *15/00;35/20*

U.S. Cl. 172—763 **8 Claims**

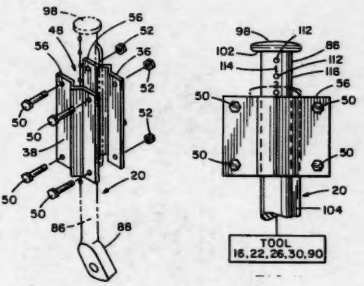
1. An agricultural tool holder assembly, comprising:

a support forming a passageway therethrough and being operable in a capturing position and a releasing position;

an agricultural tool holder forged from a single, continuous metal blank, said tool holder including,

an elongated shaft including an upper end, a lower end, and a peripheral surface bridging said upper and lower ends, said shaft extending through said passageway along a lengthwise axis such that said upper end is disposed above said support and said lower end is disposed below said support, said shaft being fixed relative to said support while said support is in said capturing position and being movable relative to said support while said support is in said releasing position,

an enlarged head disposed at said upper end of said shaft, said enlarged head projecting radially outwardly from and sub-



stantially encompassing said peripheral surface to prevent said upper end of said shaft from moving downward along said lengthwise axis into said passageway,

keying means for engaging said support to limit rotation of said shaft relative to said support about said lengthwise axis while said support is in said capturing position, and

a mounting portion disposed in proximity to said lower end of said shaft; and an agricultural tool mounted to said mounting portion of said agricultural tool holder.

5,485,887

PNEUMATIC IMPACT TOOL AND PISTON FOR A PNEUMATIC IMPACT TOOL

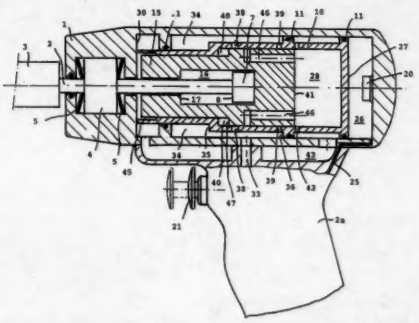
Georges Mandanis, Lucerne, Switzerland, assignor to IMT Integral Medizintechnik AG, Ennetburgen, Switzerland

Filed Mar. 22, 1994, Ser. No. 216,059

Claims priority, application Switzerland, Mar. 30, 1993, 976/93

Int. Cl.[6] B25D *17/06;17/24*

U.S. Cl. 173—17 **10 Claims**



1. A pneumatic impact tool, particularly for surgical use, comprising:

a housing;

a tool holder held by said housing and having a first section inside said housing and a second section outside of said housing, said first section being provided at a free end thereof with a head having a first and a second impact surface, and said second section being provided at a free end thereof with a working tool holding means;

a cylinder provided within said housing;

a piston provided within said cylinder and having an inner hollow space enclosing said head, said piston being driveable by pneumatic pressure to oscillate within said cylinder, and

a manually operable switch means provided for selectively slidably displacing said cylinder within said housing and relative to said head from a first position to a second position, and wherein in said first position of said cylinder said oscillating piston impacts only on said first impact surface of said head and in said second position of said cylinder said oscillating piston impacts only on said second impact surface of said head.

5,485,888

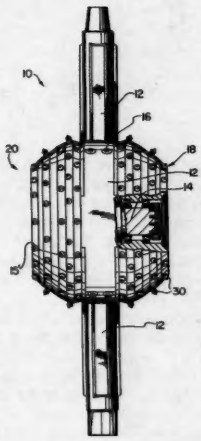
SPHERICAL REAMING BIT

J. Richard England, Sudbury, Canada, assignor to R. H. Woods, Ltd., Watford, Canada

Continuation-in-part of Ser. No. 62,174, May 17, 1993, Pat. No. 5,413,183. This application Feb. 3, 1995, Ser. No. 383,223

Int. Cl.[6] E21B *10/22*

U.S. Cl. 175—53 **22 Claims**



1. A bit for reaming an opening in an earth formation, comprising:

at least one shaft for connection with drive means;

at least three stems on said shaft, each stem for movably mounting a semi-spherical roller cutter; and

a plurality of semi-spherical roller cutters, each stem including a semi-spherical roller cutter, said roller cutters being arranged on said stems such that said semi-spherical roller cutters are circumscribable in a sphere.

5,485,889

STEERING DRILL BIT WHILE DRILLING A BORE HOLE

Benjamin Gray, Silver Valley, Canada, assignor to Sidekick Tools Inc., Silver Valley, Canada

Continuation-in-part of Ser. No. 279,348, Jul. 25, 1994, abandoned. This application Mar. 3, 1995, Ser. No. 400,106

Int. Cl.[6] E21B *7/04*

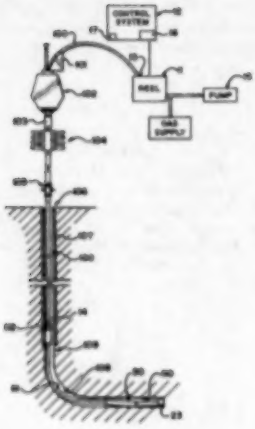
U.S. Cl. 175—61 **16 Claims**

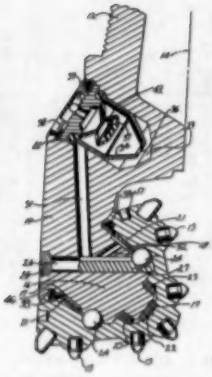
1. A method of drilling a bore hole in the earth comprising:

providing a drill string having a trailing end at ground level and a leading end for insertion into the bore hole;

connecting a supply of drilling fluid to the trailing end for pumping the drilling fluid to the leading end;

providing a drilling tool having an elongate tool body defining a longitudinal axis therealong, providing a motor mounted on the tool body to generate drive power, providing a drill bit mounted on the tool body at a leading end thereof for rotation of the drill bit in an angular direction relative to the tool body about the longitudinal axis in responsive to the drive power from the motor, and providing means forming a bend section in the tool body defining a bend axis of the tool body





transverse to the longitudinal axis of the tool body such said rotation of the drill bit tends to steer a longitudinal drilling direction of the tool body in a direction at an angle to a plane containing the bend axis and the longitudinal axis;

connecting a trailing end of the drilling tool body to the leading end of the drill string so as to communicate drilling fluid from the drill string to the tool body to cause rotation of the drill bit;

in order to form a straight section of the bore hole, allowing counter-rotation of the tool body relative to the leading end of the drill string in an angular direction opposite to the angular direction of the drill bit in response to torque generated at the drill bit so as to cause rotation of the tool body and the transverse bend axis about the longitudinal axis, with motive force for the counter-rotation being provided by the torque from the drill bit, and controlling the counter-rotation to be maintained during the formation of the straight section at a rate less than that of the rotation of the drill bit;

and, in order to steer the longitudinal drilling direction by forming a curved section of the bore hole, occasionally halting the counter-rotation to hold the bend axis at a predetermined orientation.

5,485,890

ROCK BIT

Chris E. Cawthorne; Steve Peterson, both of The Woodlands, Tex.; Naresh J. Kar, Westminster, Calif., and Madapusi K. Keshavan, The Woodlands, Tex., assignors to Smith International, Inc., Houston, Tex.

Continuation of Ser. No. 259,433, Jun. 14, 1994, abandoned. This application Apr. 4, 1995, Ser. No. 416,484

Int. Cl.[6] E21B *10/22*

U.S. Cl. 175—228 **27 Claims**

1. A rock bit for drilling subterranean formations comprising:

a bit body including a plurality of journal pins, each journal pin having a bearing surface;

a cutter cone mounted on each journal pin and including a bearing surface;

a pressure-compensated grease reservoir in communication with such bearing surfaces;

a grease in the grease reservoir and adjacent the bearing surfaces;

an elastomeric O-ring seal between the journal pin and the cone for retaining the grease in the bearing; and

a stationary sealing surface adjacent to the O-ring seal having a sealing surface with a Vickers hardness of at least 1000 and a surface finish in the range of from 5 to 32 microinches AA.

5,485,891

CONE DRILL BIT

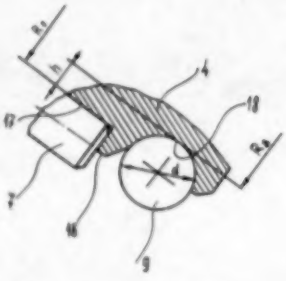
Brazhentsev A. Vladimirovich, Moscow, and Brazhentsev V. Pavlovich, Moskovskaya, both of, Russian Federation, assignors to Obshestvo S Organichennoi Otvetstvennostju "Nauchino-Proizvodstvennaya Firma Spettsstroyservis" , Moscow, Russian Federation

Filed Mar. 21, 1994, Ser. No. 215,078

Claims priority, application Russian Federation, Jan. 11, 1993, 93047140

Int. Cl.[6] E21B *10/00*

U.S. Cl. 175—372 **2 Claims**



1. A cone drill bit comprising

a bit body for thread jointing to a drill string, said body including three extending legs upon it;

trunnions made as an integral part of each said legs and extending transversely therefrom;

a set of inlet and outlet blowing passages interlinked and arranged in the bit body, legs and trunnions;

multi-crown cones mounted on the trunnions and outwardly equipped with hard-alloy inserts attached to the cone body or steel teeth milled on the cone body;

a support unit for rotatably mounting each cone on the trunnion, each support unit including a locking radial thrust ball bearing arranged between a peripheral and end journal roller bearings, and also comprising a lock pin, a diameter (d) of the balls in the locking ball bearing being defined by the relation:

$$D/d=3-13.2,$$

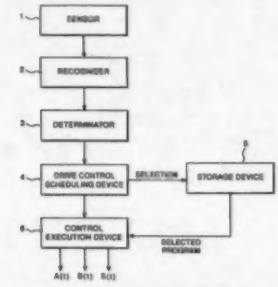
where D is a bit diameter.

5,485,892

DRIVE CONTROL SYSTEM FOR AUTOMOBILE

Kenji Fujita, Yokohama, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 959,915, Oct. 14, 1992, abandoned. This application May 10, 1995, Ser. No. 438,727
Claims priority, application Japan, Jan. 14, 1991, 3-293626
Int. Cl.[6] B62D *6/00*
U.S. Cl. 180—167 **18 Claims**



DRIVE SITUATION		CONTROL PROGRAM: CRUISE SPEED CONTROL	TURNING SPEED CONTROL	RELATIVE SPEED CONTROL	TARGET SPEED CONTROL
NO PRECEDING CAR	STRAIGHT	○			
	CURVE	○	○		
FOLLOWING PRECEDING CAR	NORMAL DRIVE STRAIGHT	○		○	
	NORMAL DRIVE CURVE	○	○	○	
	HEAVY TRAFFIC	○			○

1. An automatic drive control system for a car comprising:

recognizing means for recognizing external circumstances in a path ahead of the car;

drive situation determining means for determining a drive situation of the car on the basis of circumstances recognized by said recognizing means;

program storage means for storing control programs prepared for a plurality of different drive control modes according to previously specified drive situations;

control scheduling means for selecting at least one of said control programs according to a drive situation determined by said drive situation determining means;

control means for providing control signals in accordance with said at least one of said control programs selected by said control scheduling means; and

actuators for providing said car with speed and direction control in response to said control signals.

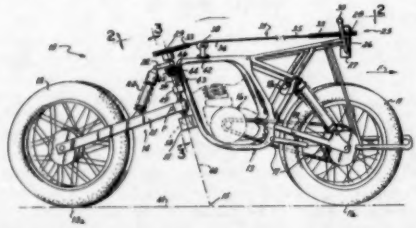
5,485,893

VEHICLE

Thomas W. Summers, 757 Logan St., Louisville, Ky. 40204

Filed Jun. 29, 1993, Ser. No. 84,428
Int. Cl.[6] B62K *21/00*
U.S. Cl. 180—219 **29 Claims**

1. A two wheel single track vehicle having a center of gravity



and comprising:

a front frame having support structure including a seat for supporting a vehicle operator thereon;

a rear frame;

a front wheel connected to said front frame and a rear wheel connected to said rear frame;

drive means mounted to said front frame for driving said front wheel; and,

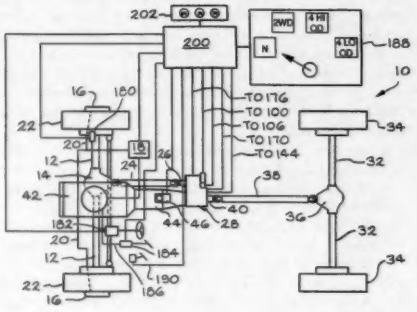
a steering mechanism operable from said front frame for turning said rear wheel about a turn axis, said turn axis being defined by a steering head disposed between said front and rear wheels and connecting said front and rear frames and disposed rearward of said center of gravity, wherein said turn axis is inclined in a longitudinal direction extending downwardly and toward said front wheel.

5,485,894

ON DEMAND VEHICLE DRIVE SYSTEM

Will Watson, Southfield, Mich.; Alan L. Miller, Ithaca, N.Y.; Drew A. Sundquist, Canton, Mich.; Roger T. Simpson, Ithaca, N.Y.; Diane K. Ducklow, Farmington, Mich.; Joseph W. Beckerman, Livonia, Mich., and Dan J. Showalter, Plymouth, Mich., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Division of Ser. No. 903,696, Jun. 24, 1992, Pat. No. 5,407,024. This application Feb. 10, 1995, Ser. No. 387,139
Int. Cl.[6] B60K *17/348*
U.S. Cl. 180—248 **20 Claims**



1. An adaptive four-wheel vehicle drive system comprising, in combination,

a primary drive line including a primary drive shaft and primary drive wheels at the front of the vehicle,

a secondary drive line including a secondary drive shaft and secondary wheels at the rear of the vehicle,

a transfer case having a primary output shaft adapted to drive said primary drive wheels, a secondary output shaft adapted to drive said secondary drive wheels, modulating clutch means for selectively transferring torque from said primary output shaft to said secondary output shaft,

means for sensing the rotational speed of said primary drive line,

means for sensing the rotational speed of said secondary drive line, and

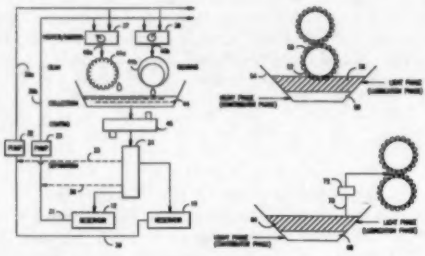
a microcontroller for comparing the speed of said primary drive line with the speed of said secondary drive line and engaging said modulating clutch means in increments when the difference between said speeds is greater than a predetermined value and disengaging said modulating clutch means in increments when said difference is less than said predetermined value.

5,485,895

MULTI-PHASE LUBRICANT PROCESS FOR LUBRICATING WITH MULTI-PHASE LUBRICANTS

Brian K. Peterson, Yardley, Pa., and Andrew Jackson, Pennington, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 7, 1994, Ser. No. 319,766
Int. Cl.[6] F01M 5/00
U.S. Cl. 184—6.22 23 Claims



1. An apparatus for lubricating an operating component of a system in which the operating component is exposed to a variation in a condition of operation which is benefitted by adjusting at least one physical property of the lubricant which lubricates the component during operation, comprising:

(a) a reservoir comprising a first lubricant of low density and low viscosity and a second lubricant of higher density and higher viscosity than the first lubricant, the second lubricant is at least partially immiscible with the first lubricant under an operating condition suitable for at least partial immiscibility;

(b) a third lubricant comprising at least a partial mixture of the first lubricant and the second lubricant which partial mixture forms within the reservoir under an operating condition suitable for at least partial miscibility of the first lubricant and the second lubricant;

(c) an operating component, at least a portion of the operating component being located within the reservoir, under a condition of immiscibility, and the operating component being in contact with the third lubricant under an operating condition suitable for at least partial miscibility of the first lubricant and the second lubricant, the operating component further being in contact with the first lubricant under an operating condition suitable for immiscibility, the contact of the operating component with the first and the third lubricants occurring without discontinuing system operation.

12. A process for lubricating an operating component of a system in which the operating component is exposed to a variation in a condition of operation during System operation, comprising:

(a) maintaining a first lubricant of low density and low viscosity and a second lubricant of higher density and higher viscosity than the first lubricant in a lubricant zone under an operating condition in which the first lubricant and the second lubricant are at least partially immiscible;

(b) contacting the operating component with the first lubricant under the operating condition of immiscibility;

(c) conducting the contacting of the operating component under an operating condition which is different from the operating condition of step (b) and which operating condition causes at least partial miscibility of the first lubricant and the second lubricant to form a third lubricant which has at least one property which is different from that property of the first lubricant and the second lubricant;

(d) contacting the operating component with the third lubricant, the third lubricant being more appropriate for lubricating the operating component under the different operating condition than the first lubricant or the second lubricant and

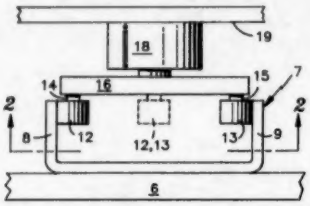
(e) returning the third lubricant to step (a) and repeating steps (b)–(d) without discontinuing system operation.

5,485,896

ROTARY ELEVATOR CAR DOOR COUPLING

Thomas M. Kowalczyk; Thomas M. McHugh, both of Farmington; Edward E. Ahigian, West Hartford; Jerome F. Jaminet, South Windsor; Thomas He, Unionville; Richard E. Peruggi, Glastonbury; Richard E. Kulak, Bristol, and David W. Barrett, East Hartland, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 6, 1994, Ser. No. 223,926
Int. Cl.[6] B66B 13/12
U.S. Cl. 187—330 4 Claims



1. Apparatus for coupling an elevator hoistway door to an elevator car door so that the two may be operated in unison, comprising:

a pair of parallel vertical walls extending outwardly into the hoistway from a surface of a hoistway door;

a member having a length dimension which is slightly greater than the distance between the mutually facing surfaces of said walls and having a width dimension essentially orthogonal to said length dimension which is significantly less than the distance between said surfaces, said member disposed for rotation adjacent a surface of the elevator car door facing the landing side of the elevator hoistway in a position, when at a landing, to be between said surfaces; and

an actuator for rotating said member from an uncoupled position, in which the length of said member is parallel to said walls, into a coupling position in which the length of said member is substantially orthogonal to and wedged between said walls, thereby to provide horizontally rigid coupling between the elevator car door and the hoistway door throughout the full range of travel.

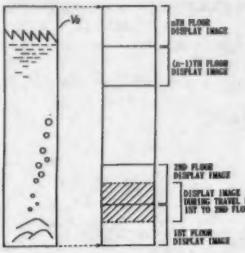
5,485,897

ELEVATOR DISPLAY SYSTEM USING COMPOSITE IMAGES TO DISPLAY CAR POSITION

Kimio Matsumoto, Moriguchi; Ichihiro Sawaike, Neyagawa; Atsuo Nishigakik, Moriguchi; Akitoshi Yamashita, Hirakata, and Tomohiko Tsumura, Osakaseayama, all of, Japan, assignors to Sanyo Electric Co., Ltd., and Fujitec Co., Ltd., both of Osaka, Japan

Continuation of Ser. No. 156,074, Nov. 23, 1993, abandoned.
This application Feb. 15, 1995, Ser. No. 389,619
Claims priority, application Japan, Nov. 24, 1992, 4-313165; Nov. 25, 1992, 4-314705; Mar. 15, 1993, 5-052774; Mar. 15, 1993, 5-052775; Mar. 15, 1993, 5-052776
Int. Cl.[6] B66B 3/02
U.S. Cl. 187—399 15 Claims

1. An elevator system having an elevator operation control unit for controlling the upward or downward movement of an elevator car and an image display unit provided inside the car, the elevator system comprising an image reproduction unit for feeding a main image signal for forming a background image to the image display unit, a superimposition image production circuit for producing a subimage signal for forming a floor indicating image based on a floor signal from the elevator operation control unit and a direction indicating image showing whether the car is in an upward or downward movement based upon an elevator operation data obtained from the operation control unit, and an image composition unit for combining the main image signal and the subimage


Vo
nTH FLOOR DISPLAY IMAGE
(n-1)TH FLOOR DISPLAY IMAGE
2ND FLOOR DISPLAY IMAGE
DISPLAY IMAGE DURING TRAVEL FROM 1ST TO 2ND FLOOR
1ST FLOOR DISPLAY IMAGE

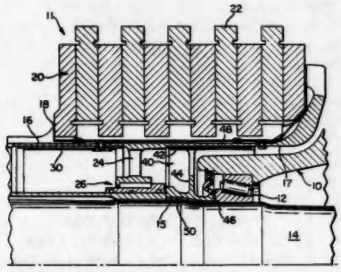
signal into a composite image signal to superimpose the floor indicating image on the background image and feeding the composite image signal to the image display unit.

5,485,898

SPACER MEMBER FOR AIRCRAFT BRAKES

Joseph M. Patko, South Bend, Ind., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Jun. 22, 1994, Ser. No. 263,708
Int. Cl.[6] F16D *55/36*
U.S. Cl. 188—71.5 **11 Claims**



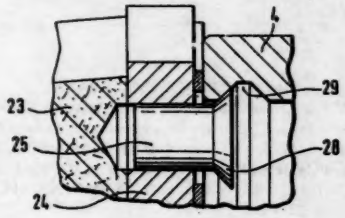
1. An aircraft brake including a spacer member, the aircraft brake comprising a torque tube located about an axle and the torque tube connected with a plurality of discs of the aircraft brake, the torque tube including a pedestal which is integral with the torque tube and extends radially inwardly for support via bushing means by said axle, the spacer member located between an inner diameter surface of the torque tube and an outer diameter surface of the axle, the spacer member having an outer diameter surface including a coating thereabout which supports the inner diameter surface of the torque tube and an inner diameter surface which is supported by the axle, the coating providing improved frictional contact with the inner diameter surface of said torque tube in order to minimize galling, and a support ring disposed between the inner diameter surface of said spacer member and the outer diameter surface of the axle, the support ring and spacer member each including respective splines to effect therebetween a splined interface that prevents rotation relative to one another, whereby the spacer member provides configuration stability and support for the torque tube.

5,485,899

FLOATING-FRAME SPOT-TYPE DISC BRAKE FOR HIGH-TORQUE AUTOMOTIVE VEHICLES

Rudolf Thiel, Frankfurt am Main; Ulrich Klimt, Gross-Umstadt, and Andreas Doell, Frankfurt am Main, all of, Germany, assignors to ITT Automotive Europe GmbH, Frankfurt am Main, Germany

Division of Ser. No. 925,708, Aug. 4, 1992, Pat. No. 5,363,944.
This application Jun. 30, 1994, Ser. No. 269,119
Claims priority, application Germany, Aug. 8, 1991, 41 26 196.8
Int. Cl.[6] F16D *55/225*
U.S. Cl. 188—73.1 **4 Claims**



1. A brake shoe mounting for a spot type disc brake having a frame, said frame having a brake cylinder including a brake piston having an open end;

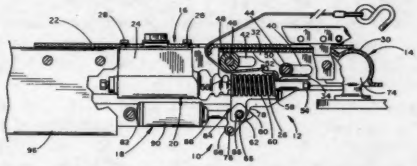
a brake shoe comprising a friction pad and a back plate, said back plate having a front surface having said friction pad attached thereto, said back plate also having a rear surface and a pin projecting from said back plate rear surface, said pin having a broadened end spaced from said rear surface of said back plate; said piston having an annular groove formed within said open end, one side of said pin broadened end received within said annular groove of said piston at one point only along the circumference of said annular groove and spring means for urging and holding the pin end within said annular groove of said piston.

5,485,900

BRAKE LOCKOUT DEVICE

Martin L. Denny, Des Moines, Iowa, assignor to Dico, Inc., Des Moines, Iowa

Filed Mar. 22, 1994, Ser. No. 215,703
Int. Cl.[6] B60T *7/20*
U.S. Cl. 188—112 R **3 Claims**



1. An automatic brake lockout for restricting operation of a trailer hitch surge suppressor, the automatic brake lockout being of a construction that when engaged, the automatic brake lockout restricts operation of the trailer hitch surge suppressor as a trailer hitch, operably coupled to the trailer hitch surge suppressor, is moved rearwardly, and when engaged, the automatic brake lockout continues to restrict operation of the trailer hitch surge suppressor until the automatic brake lockout is disengaged, the automatic brake lockout apparatus comprising:

a. a trailer connection member operably connected to the trailer hitch surge suppressor, said trailer connection member being provided with a notch;

b. a pulling vehicle connection member operably connected to the trailer hitch surge suppressor and slidably coupled to said

trailer connection member in a manner which activates the surge suppressor upon movement of said trailer connection member toward said pulling vehicle connection member;

c. a lockout pin;

d. a pair of struts operably and pivotally connected to said pulling vehicle connection member and secured to said lockout pin in a manner which allows said pair of struts to be moved into an orientation where said lockout pin engages said notch of said trailer connection member; and

e. means for automatically moving said lockout pin out of said notch upon movement of said trailer connection member away from said pulling vehicle connection member.

5,485,901

ELECTROMAGNETIC BRAKE

Hideo Akima; Yoshikiyo Ishikura, and Takaaki Kishi, all of Yamato, Japan, assignors to Fujitsu Ltd., Kawasaki, and Tokyo Buhin Kogiyo Co., Ltd., Kanagawa, both of, Japan

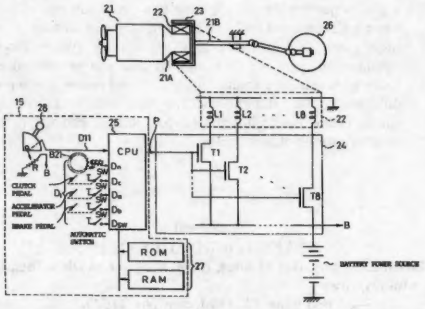
PCT No. PCT/JP91/00177, § 371 Date Oct. 11, 1991, § 102(e) Date Oct. 11, 1991, PCT Pub. No. WO91/12657, PCT Pub. Date Aug. 22, 1991

PCT Filed Feb. 14, 1991, Ser. No. 768,659

Claims priority, application Japan, Feb. 14, 1990, 2-034871; Feb. 14, 1990, 2-034872

Int. Cl.[6] H02P *15/00*

U.S. Cl. 188—164 **4 Claims**



1. An electromagnetic brake for generating a braking torque on a rotary drive shaft of a drive force supply unit, comprising:

a plurality of electromagnetic coils disposed in fixed relationship to the drive force supply unit, the coils being responsive to the flow of an energizing current therethrough for producing a corresponding magnetic field;

a rotor, made of a conductive material, and affixed to the rotary drive shaft for common rotation therewith and disposed relatively to said coils so as to rotate in the magnetic field produced thereby in response to the flow of energizing current therethrough, the rotation of the rotor in the magnetic field producing an eddy current in the rotor and the eddy current converting the rotational energy imparted to the rotor by the shaft into heat, thereby to generate the braking torque on the rotary drive shaft;

switching means connected to the electromagnetic coils for selectively and controllably supplying the flow of energizing current thereto; and

control means, responsive to external control data, for generating and supplying switching data to the switching means and thereby to cause the switching means to selectively control the ON/OFF ratio of the flow of energizing current supplied by the switching means to the electromagnetic coils.

5,485,902

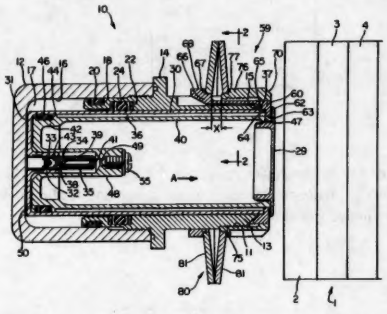
AIRCRAFT BRAKE PISTON HYDRAULIC ADJUSTER ASSEMBLY

Fred W. Berwanger, South Bend, Ind., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Aug. 5, 1994, Ser. No. 286,307

Int. Cl.[6] F16D *65/38*

U.S. Cl. 188—196 A **19 Claims**



1. A brake piston adjuster assembly, comprising a housing having therein a housing bore, a first piston disposed slidably in the bore to be extendible therefrom and including a first piston bore and a first piston end, a second piston disposed slidably within the first piston bore and including a second piston bore and a second piston end, the first piston including relief valve means disposed at an inlet of the first piston end, the second piston end adjacent said inlet and the piston ends defining therebetween an inner piston chamber, and the first piston including a second end which cooperates with a portion of the adjuster assembly comprising return stroke clearance adjustment means connected with the housing, so that fluid pressure received within said housing bore displaces the first and second pistons axially outwardly of the housing bore to operate the clearance adjustment means which terminates displacement of the first piston when the running clearance is achieved, and further fluid pressure received in the housing bore causing said relief valve means to open and permit fluid flow to the inner piston chamber and effect axial displacement of the second piston relative to the first piston.

5,485,903

REVERSAL PREVENTIVE MECHANISM OF A SILENT TYPE FOR USE IN A FISHING REEL

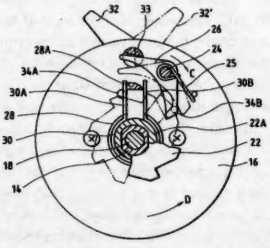
Masaji Saito, and Akira Yamaguchi, both of Saitama, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

Filed May 17, 1994, Ser. No. 243,802

Claims priority, application Japan, May 19, 1993, 5-031334 U

Int. Cl.[6] A01K *89/02*

U.S. Cl. 192—8 R **6 Claims**



1. A silent type mechanism for preventing reverse rotation, said mechanism comprising:

a rotatable ratchet wheel;

a securing claw pivotally mounted with respect to said ratchet wheel and biased so as to engage with said ratchet wheel;

a spring wound at least partially around said ratchet wheel and frictionally rotatable in conjunction with rotation of said ratchet wheel, said spring having two extension portions extending outward therefrom; and,

a control member rotatable with respect to said ratchet wheel, and driven by said spring so as to separate said securing claw from said ratchet wheel when said ratchet wheel is rotated in a first direction, wherein said control member and said spring are interconnected to each other such that a portion of said control member is held by and interposed between said two extension portions.

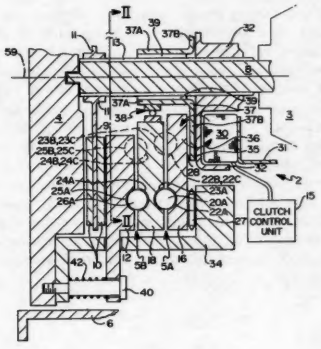
5,485,904

CLUTCH BALL RAMP ACTUATOR WITH DRIVE AND COAST APPLY

Gregory J. Organek, Dearborn; David M. Preston, Clarkston, and David A. Janson, Plymouth, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 31, 1994, Ser. No. 189,366
Int. Cl.[6] F16D *13/04;27/112;43/20*
U.S. Cl. 192—35 **12 Claims**

1. A ball ramp mechanism for coupling two rotating elements



comprising:

an input element driven by a prime mover and rotating about an axis of rotation;

an output element having an axis of rotation coaxial with said axis of rotation of said input element for rotating an output device;

a first ball ramp actuator for generating an axial movement comprising; an annular control ring adapted to be magnetically coupled to said output element and to rotate therewith, said control ring having at least two circumferential control ramps formed in a first face of said control ring, said control ramps varying in axial depth, an equivalent number of rolling elements one occupying each of said ramps, an activation ring having an axis of rotation along said axis of rotation of said control ring, said activation ring having at least two activation ramps substantially identical in number, shape and a dial position to said control ramps in said control ring where said activation ramps at least partially oppose said control ramps and where each of said rolling elements is trapped between said activation ramp and a respective at least partially opposed control ramp, said control ring axially and rotationally movably disposed relative to said activation ring;

a second ball ramp actuator for generating an axial movement wherein said activation ring has a plurality of opposite acting circumferential activation coast ramps formed in a second face of said activation ring and substantially identical partially opposed plate ramps formed in a pressure plate where said plate ramps and said coast ramps have a variable depth with an equivalent number of rolling elements one occupying each pair of partially opposed ramps which roll along said coast ramps and said plate ramps and operate to axially displace the activation ring from the pressure plate when rotated in a relative direction opposite to the direction of rotation causing axial displacement of said first fall ramp actuator;

coupling means for rotatably joining said input element to said output element where said coupling means varies the degree of rotational Coupling between said input element and said output element according to the axial position of said control ring relative to said activation ring, said coupling means comprising: a flywheel attached to said input element having a friction surface; a clutch disc having a first friction surface for frictionally reacting against said flywheel friction surface and a second friction surface; said pressure plate having a friction surface for frictionally reacting against said clutch disc second friction surface where said pressure plate is nonrotatably connected-to said flywheel;

a locking ring nonrotatably attached to said output element;

a control support element disposed between said control ring and said locking ring, said control support rotatably supported by said output element;

a coil for creating a magnetic field in said locking ring and said control ring and said control support thereby magnetically joining said control ring to said output element, Said coil being electrically energized by a clutch control unit where said activation ring rotates with said input element and said control ring rotates with said output element according to said control means;

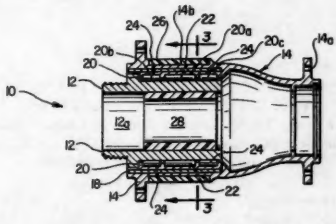
control clutch means for limiting the rotation of said activation ring relative to said control ring when said coil is energized, said clutch means attached to said control support and to said activation ring.

5,485,905

LIGHTWEIGHT OVERRUNNING CLUTCH ASSEMBLY

H. John Rader, III, 4428 Amherst, Dallas, Tex. 75225

Filed Apr. 1, 1994, Ser. No. 222,258
Int. Cl.[6] F16D *23/00;41/06*
U.S. Cl. 192—64 **15 Claims**



1. An overrunning clutch comprising:

a tubular shaft member having an inner surface;

a housing member rotatably sleeved about said shaft member, said housing member having an outer surface;

means for establishing torque communication between said housing member and said shaft member only when relative rotation between said housing member and said shaft member is in a first direction;

a first reinforcing material circumscribing said outer surface of said housing member for containing expansive forces applied to said housing member during said torque communication; and

a second reinforcing material urged against said inner surface of said shaft member for resisting compressive forces applied to said shaft member during said torque communication, said reinforcing materials having high tensile strength and a high modulus of elasticity.

5,485,906
COIN VALIDATORS

Michael E. Newton. Surby, Isle of Man, and Michael D. Nunn, North Ascot, United Kingdom, assignors to Mars Incorporated, McLean, Va.

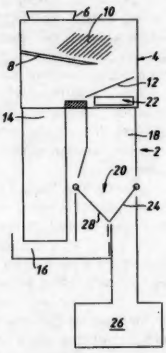
PCT No. PCT/GB91/02149, § 371 Date Jun. 4, 1993, § 102(e) Date Jun. 4, 1993, PCT Pub. No. WO92/10814, PCT Pub. Date Jun. 25, 1992

PCT Filed Dec. 4, 1991, Ser. No. 70,422

Claims priority, application United Kingdom, Dec. 7, 1990, 9026676

Int. Cl.[6] G07D *5/00*

U.S. Cl. 194—203 **18 Claims**



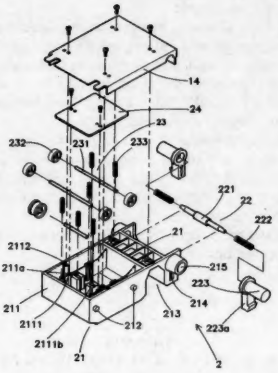
12. A coin validator comprising:

a testing station;

a flap arranged downstream of the testing station and arranged to be moved away from a first position by a coin moving therepast and which would normally return to its first position thereafter;

a sensing arrangement responsive to the flap returning to its first position for enabling the accumulation of credit;

the flap being arranged to be held away from the first position by a thread attached to the coin and held by a user, thereby to inhibit the accumulation of credit.



a paper money recognition circuit controlled to recognize inserted paper money; and

wherein said paper money recognition circuit detects and recognizes inserted paper money, and drives said transmission unit to deliver the inserted paper money forward when the inserted paper money is recognized or drives said transmission unit to deliver the inserted paper money backwards when determined to be counterfeit money;

wherein said locking device comprises a stepped axle mounted within a receiving chamber inside a casing of said lower mainframe, two compression springs mounted around two opposite ends of said stepped axle and two retainers respectively mounted on the two opposite ends of said stepped axle and respectively supported on said compression springs, said retainers each having a hook extending through an opening in said upper mainframe into a respective locating square hole on said lower mainframe at either side to hold said upper mainframe and said lower mainframe together, the hooks of said retainers being released from the locating square holes on said lower mainframe permitting said lower mainframe to be detached from said upper mainframe when said retainers are respectively pushed inwards to compress said compression springs.

5,485,907
PAPER MONEY RECOGNITION AND TRANSMISSION SYSTEM FOR VENDING MACHINES

Yuan F. Chang, Taipei, Taiwan, Prov. of China, assignor to Gamemax Corporation, Taipei, Taiwan, Prov. of China

Filed Aug. 23, 1994, Ser. No. 294,365

Int. Cl.[6] G07D *7/00*

U.S. Cl. 194—203 **4 Claims**

1. A paper money recognition and transmission system for a vending machine, comprising:

a housing having a paper money slot for the insertion of paper money by consumers and a paper money outlet;

an upper mainframe disposed inside said housing, said upper mainframe comprising a casing having a plurality of wheel holders, a plurality of roller sets respectively mounted on said wheel holders and turned to deliver inserted paper money, a cover board covered over said roller sets, a plurality of springs engaged between said cover board and said roller sets, and a locking device;

a lower mainframe disposed inside said housing and connected to the casing of said upper mainframe and locked in position by said locking device;

a transmission unit mounted on said lower mainframe, said transmission unit comprising a step motor engaged to drive a gear transmission mechanism, a belt transmission mechanism and two rubber rollers which operate to deliver inserted paper money;

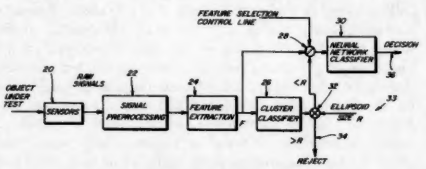
5,485,908
PATTERN RECOGNITION USING ARTIFICIAL NEURAL NETWORK FOR COIN VALIDATION

Chuanming Wang, and Mark H. Leibu, both of St. Louis, Mo., assignors to Coin Acceptors, Inc., St. Louis, Mo.

Filed Jul. 12, 1994, Ser. No. 273,931

Int. Cl.[6] G07D *5/08*

U.S. Cl. 194—317 **18 Claims**



7. In a vending control device for installing on vending machines, improved means for determining if a coin is a valid coin, and if so, its denomination comprising a coin track along which coins move upon entering a vending machine, optical sensor means located along the track for optically sensing the presence of a coin including means for producing a signal when a coin is identified and terminating the signal when the coin has moved past the optical sensor means, other sensor means adjacent to the optical sensor means including means for generating an electro-

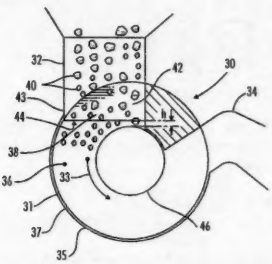
magnetic signal when the coin is adjacent thereto, said signal being affected by the metallic content and physical characteristics of the coin and having features imposed thereon that are representative of the coin, means for extracting from the signals generated by the other sensor means components representative of predetermined coin characteristics imposed on the signal, means for combining preselected ones of the extracted components of the signal, ellipsoidal cluster classifier means connected to the feature extraction means, means to determine if a feature vector falls within the cluster classifier with a predetermined similarity threshold, if the similarity exceeds the threshold the coin is indicated as being a valid coin and otherwise the coin will be rejected, and means for applying the output of the feature extraction means and the output of the comparison means to a neural network classifier device having outputs on which decisions are made as to whether the coin should be accepted or rejected.

5,485,909

APPARATUS WITH IMPROVED INLET AND METHOD FOR TRANSPORTING AND METERING PARTICULATE MATERIAL

Andrew G. Hay, Gardena, Calif., assignor to Stamet, Inc., Gardena, Calif.

Filed Aug. 31, 1993, Ser. No. 115,173
Int. Cl.[6] B65G *31/04*
U.S. Cl. 198—642 **31 Claims**



1. An improved apparatus for transporting particulate material of the type having a movable wall structure defining a transport channel and having an inlet for receiving particulate material into the channel and an outlet for emitting particulate material from the channel, the inlet defining an inlet channel contiguous with the transport channel to provide a continuous flow path for particulate material to flow through the inlet channel and into the transport channel, wherein the movable wall structure defines at least one wall movable in the direction from the inlet toward the outlet for imparting a force directed toward the outlet on particulate material entering the channel from the inlet, the improvement comprising:

a shroud member assembly having a first member extending at least partially across a portion of the continuous flow path as defined by the inlet channel and the transport channel and covering a portion of the moveable wall adjacent the inlet for inhibiting the movable wall from imparting a force on the particulate material as the material passes through the inlet.

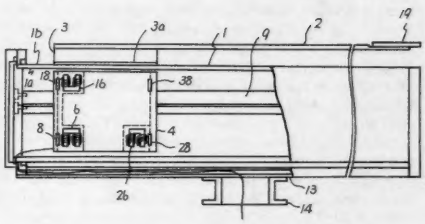
5,485,910

CONVEYOR

Yoshimasa Oda, and Shinji Koyano, both of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Japan

Filed Jul. 12, 1994, Ser. No. 273,634
Claims priority, application Japan, Jul. 13, 1993, 5-173312; Jun. 17, 1994, 6-135902
Int. Cl.[6] B65G *15/58*
U.S. Cl. 198—690.1 **6 Claims**

1. A conveyor comprising:



a conveying rod on which a workpiece is laid;

a floating member located on an outer peripheral surface side of said partition wall, said floating member having said conveying rod;

a conveying body located on an inner peripheral surface side of said partition wall, said conveying body being movable between both ends of said partition wall;

electromagnets provided on said conveying body for generating magnetic forces for supporting said floating member;

sensor portions for detecting positions of said floating member;

targets provided on said floating member so as to face said electromagnets and made of magnetic material;

magnetic support portions composed of said electromagnets, said targets and said sensor portions; and

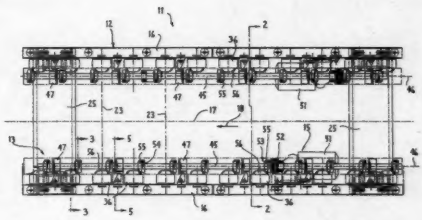
adjusting means for taking a balance of forces to be applied to said magnetic support portions by said workpiece.

5,485,911

INTERIOR LINE-SHAFT DRIVEN POWERED ROLLER CONVEYOR

Russell W. Kettelson, Drayton Plains, and Dion Spurr, Sterling Heights, both of Mich., assignors to Newcor, Inc., Bloomfield Hills, Mich.

Filed Mar. 9, 1994, Ser. No. 208,606
Int. Cl.[6] B65G *13/06*
U.S. Cl. 198—791 **17 Claims**



1. A powered roller conveyor for transporting loads, such as pallets, comprising:

a generally horizontally elongate frame defining a generally horizontally extending longitudinal direction and including first and second elongate and generally horizontally extending side frames disposed in generally parallel but sidewardly-spaced relation so as to define a transverse region therebetween;

a plurality of roller units mounted on each said side frame in spaced relation longitudinally along the respective side frame, said roller units being positioned adjacent an inner side of the respective side frame so as to be disposed within the transverse region;

each said roller unit including cantilevered mounting means fixed to the respective side frame and projecting horizontally sidewardly therefrom into said transverse region so as to terminate in a free end which is spaced a substantial distance from the other side frame, and roller means rotatably surrounding and supported on the cantilevered support means for

rotation about a substantially horizontal roller axis which extends substantially perpendicularly to the longitudinal direction;

each said roller means including an inner cylindrical drive member which is rotatably supported on said mounting means for rotation about said roller axis, and a sleevelike roller member which is concentric with said roller axis and is exteriorly rotatably supported on said cylindrical drive member, the roller means as mounted on each said side frame being positioned adjacent the inner side of the respective side frame within said transverse region so that the roller means on one said side frame are totally separate from and sidewardly-spaced from the roller means on the other said side frame to define an open load-accommodating space therebetween;

drive means extending longitudinally of said conveyor for rotatably driving said roller units as associated with said side frames, said drive means including first and second rotatably driven and substantially horizontally elongate line shafts associated with the respective first and second side frames, said first and second line shafts being respectively rotatable about substantially parallel first and second drive axes which extend substantially horizontally in perpendicular and intersecting relationship to said roller axes, said drive axes being sidewardly-spaced a substantial distance apart but disposed between said side frames within said transverse region; and

a plurality of longitudinally-spaced gear units drivingly connected between each said line shaft and the roller means associated with the respective side frame, each said gear unit including a toothed drive gear fixed to the respective line shaft for rotation therewith and a toothed driven gear coaxially fixed to said cylindrical drive member adjacent an inner axial end thereof, said drive and driven gears being maintained in direct and continuous meshing engagement with one another.

5,485,912

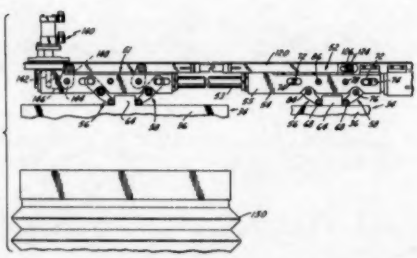
LATCHING TRANSPORT SYSTEM

William M. Faitel, Oxford, and Victor G. Schoenek, Macomb, both of Mich., assignors to Western Atlas, Inc., Hebron, Ky.

Filed Sep. 9, 1994, Ser. No. 303,471

Int. Cl.[6] B65G *37/00*

U.S. Cl. 198—803.01 **10 Claims**



1. Apparatus for transporting a carrier to a desired location along a predetermined path in a forward direction, wherein the carrier has forwardly and rearwardly facing abutment surfaces, comprising:

a latching mechanism,

means for moving said latching mechanism along said path in a forward direction,

said latching mechanism comprising a housing,

first and second latch arms carried by said housing,

each latch arm having a first end and a second end,

said first ends of said latch arms being engageable with the forwardly and rearwardly facing abutment surfaces, respectively, of the carrier to move the carrier along the path to said desired location,

said latch arms diverging from the first ends thereof in directions away from one another,

a sliding pivotal connection between the second end of each said latch arm and said housing,

and means for moving said latch arms with respect to said housing from extended positions in which the first ends thereof engage the forwardly and rearwardly facing surfaces of the carrier to cause the carrier to move with said housing, to retracted positions in which said first ends are withdrawn from engagement with said forwardly and rearwardly facing surfaces to release the carrier.

5,485,913

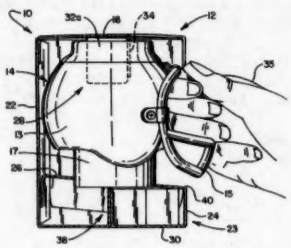
PRODUCT ACCESSIBLE DISPLAY CONTAINER

Victor E. Steinfels, III, 8627 Gavinton Ct., Dublin, Ohio 43017

Continuation of Ser. No. 125,648, Sep. 22, 1993, Pat. No. 5,348,145. This application Aug. 4, 1994, Ser. No. 285,810

Int. Cl.[6] B65D *85/44*

U.S. Cl. 206—45.19 **26 Claims**



1. A container for accessibly displaying an article having an article base and a generally annular wall extending therefrom, said container comprising:

a top wall;

an oppositely disposed bottom wall;

a pair of oppositely disposed side walls extending between said top wall and said bottom wall;

a rear wall extending between said top wall and said bottom wall adjacent said side walls;

a retainer assembly extending downwardly from said top wall into said article for retaining the top of said article laterally within said container; and

a base assembly having:

a floating deck portion disposed generally parallel to said bottom wall intermediate said top wall, said floating deck portion having an opening therethrough configured to receive said article base; and

a front wall portion extending generally orthogonally from said floating deck portion to said bottom wall to locate said floating deck portion a predetermined distance above said bottom wall, said floating deck being inwardly folded about said front wall portion.

11. A packaged article comprising a container for accessibly displaying an article packaged therewithin, said article having an article base and a generally annular wall extending therefrom, said container comprising:

a top wall;

an oppositely disposed bottom wall;

a pair of oppositely disposed side: walls extending between said top wall and said bottom wall;

a rear wall extending between said top wall and said bottom wall adjacent said side walls;

a retainer assembly extending downwardly from said top wall into said article for retaining the top of said article laterally within said container; and

a base assembly having:

a floating deck portion disposed generally parallel to said bottom wall intermediate said top wall, said floating deck portion having an opening therethrough receiving said article base therewithin; and

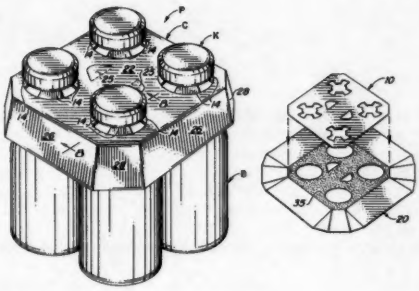
a front wall portion extending generally orthogonally from said floating deck portion to said bottom wall to locate said floating deck portion a predetermined distance above said bottom wall, said floating deck being inwardly folded about said front wall portion.

5,485,914

COMPOSITE ARTICLE CARRIER

Roger L. Martin, San Jose, Calif., assignor to Jefferson Smurfit Corporation, Clayton, Mo.

Filed Nov. 8, 1994, Ser. No. 336,010
Int. Cl.[6] B65D *75/28*
U.S. Cl. 206—145 **20 Claims**



1. An article package including a plurality of bottles each, including a body, with a necked upper portion presenting a generally cylindrical vertical surface, and an end closure projecting radially outward a slight distance beyond said body vertical surface, and a composite carrier, said carrier comprising:

(a) an outer member formed from a relatively thin, flat, blank of sheet material and including a horizontal top wall panel having side wall panels foldably joined to side edges thereof and extending downwardly therefrom over upper portions of said bottles;

(b) said outer member top wall panel including:

(i) a plurality of circular bottle receiving openings spaced from each other and each having a diameter greater than the diameter of an upper portion of each of said bottles;

(ii) at least one finger opening;

(c) an inner member including a relatively thin, flat, panel formed from a blank of sheet material, and including:

(i) at least one finger opening aligned with a said outer member finger opening;

(ii) a plurality of bottle receiving openings spaced from each other, each opening including a generally circular center portion, having a diameter less than the diameter of a related one of said outer member bottle receiving openings, and a plurality of generally rectangular projections extending radially outward from said center portion;

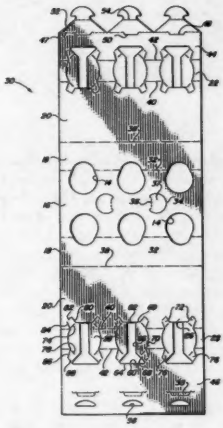
(iii) said projections defining, with said center portion and with each other, a plurality of article retaining tabs adapted to extend upwardly through related bottle receiving openings in said outer member for engagement with a related one of said bottle end closures.

5,485,915

WRAP-AROUND CARRIER WITH ARTICLE HEEL LOCK

Randall L. Harris, Powder Springs, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Sep. 21, 1994, Ser. No. 310,132
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—147 **7 Claims**



1. A package comprised of a wrap-around carrier containing articles having a bottom and lower portions adjacent the article bottom, the carrier comprising:

opposite side panels foldably connected to top and bottom panels;

the carrier including apertures located opposite the lower portions of adjacent articles, the apertures having side edges;

a retainer flap adjacent each side edge of the apertures, the retainer flaps being unconnected to the associated aperture side edge and spaced therefrom, the retainer flaps extending inwardly of the carrier transversely of the side panels and contacting opposite sides of the lower portions of the adjacent articles; and

each retainer flap having an upper portion and a lower portion, the upper portion being connected by a fold line to an upper gusset panel and the lower portion being connected by a fold line to a lower gusset panel, the upper gusset panel of each retainer flap being foldably connected to an associated side panel and the lower gusset panel of each retainer flap being foldably connected to the bottom panel.

5,485,916

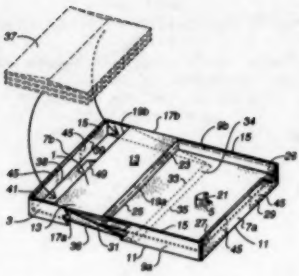
COLLATING STRUCTURE

Carl A. Dean, 3824 Garfield St., Carlsbad, Calif. 92008

Filed Feb. 22, 1994, Ser. No. 199,517
Int. Cl.[6] B65D *85/00;5/50;25/10*
U.S. Cl. 206—215 **20 Claims**

1. A foldable insert to collate an open top box for receipt, withdrawal and reinsertion of first and second separate stacks of stationery items therein, the box defined by a flat, horizontal base of overall rectangular shape having a pair of vertical end walls, defining the ends of the box, and a pair of vertical side walls, defining the sides of the box, the end walls and the side walls surrounding the base and attached thereto through means that define the periphery thereof and having common upper side edges atop said side and end walls forming a top marginal edge spaced above and parallel to said base, said insert comprising:

a) a narrow, horizontal planar display portion, defined by a pair of mutually spaced-apart elongated side edges and a pair of mutually spaced-apart shorter end edges, for placement in the



box at the level of said top marginal edge wherein said end edges would lie parallel to the side edges of the box;

b) a first support section extending from one of said elongated side edges for positioning on the base of the box for extending under a said first stack of stationery items and retaining it in horizontal presentation above the base; and,

c) a second elongated support section extending from said other elongated side edge of said display portion beneath said display portion and under a second said stack of stationery items, to separate the second stack from the first stack, said second elongated support section including an upwardly sloping portion to angle the second-stack of items upward at one end thereof;

d) said first and second support sections hingedly connected to said display portion for supporting said display portion co-planar with the top of the box.

5,485,917

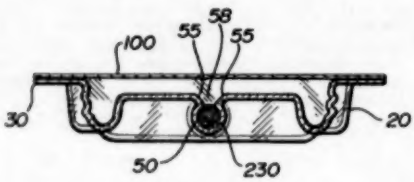
QUICK RELEASE PACKAGE FOR SURGICAL INSTRUMENT

Timothy J. Early, Hamilton, Ohio, assignor to Ethicon-Endo-Surgery, Cincinnati, Ohio

Continuation of Ser. No. 162,687, Dec. 6, 1993, abandoned. This application Apr. 4, 1995, Ser. No. 416,936

Int. Cl.[6] B65D *73/00*

U.S. Cl. 206—363 **3 Claims**



1. A thermoformed blister package, comprising:

a tray having a top, a bottom and a center;

a flange extending outwardly from the tray;

a plurality of cavities in said tray for receiving a surgical instrument wherein each said cavity has a top opening and wherein at least one of the cavities has at least one undercut extending from the tray adjacent to the top of the at least one cavity for retaining at least a portion of a said instrument within the cavity, each undercut partially extending into the top opening of the cavity thereby forming a gap; and,

means for quickly releasing a said instrument from the tray without touching the instrument wherein the means for quickly releasing the instrument from the tray comprises two finger pads extending from the bottom of the tray and spaced sufficiently apart to open up the gap sufficient to release the instrument when the pads are pressed while holding the outwardly extending flange.

5,485,918

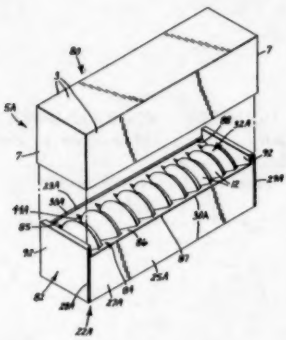
PACKAGING ASSEMBLY

Kyle D. Lasenby, Eagan, and Barry S. Peecher, Vadnais Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 787,380, Nov. 4, 1991, abandoned. This application Jul. 18, 1994, Ser. No. 276,763

Int. Cl.[6] B65D *5/50*

U.S. Cl. 206—372 **20 Claims**



1. In combination, a plurality of back-up pads having a generally disc shaped resilient portion, a circular front surface for having abrasive means attached thereto, and a circular rear surface with structure adjacent thereto for attaching the back-up pad to a source of power, each of said back-up pads having a shape, and a package for enclosing and protecting said plurality of back-up pads;

said package comprising:

an elongate bottom box portion having a longitudinal axis comprising:

three axially elongate bottom side walls each having inside and outside surfaces, opposite first and second ends and opposite edges, each of said bottom side walls being joined along at least one of its edges to the edge of another of said side walls to form an elongate main portion of said bottom box portion, and

a pair of bottom end walls disposed generally radially of said bottom box portion axis and adjacent the first and second ends of said side walls; and

a rack portion having first and second holding walls disposed at an angle relative to one another and disposed at an angle relative to the side walls of the bottom box portion, said rack portion being disposed within said elongate main portion of said bottom box portion,

said rack portion having a plurality of spaced surfaces forming slots that are sized and shaped to afford engagement with surfaces of the back-up pads to retain a spaced relationship between back-up pads and between said back-up pads and said bottom box portion, said plurality of back-up pads being received in said slots; and

top cover means for covering the elongate main portion of said bottom box portion.

5,485,919

CLAMSHELL PACKAGE AND PACKAGING SYSTEM

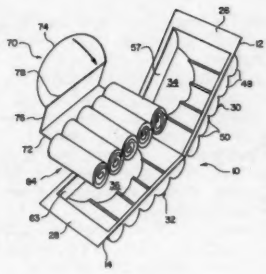
Steve Samberg, and Barry Berger, both of New York, N.Y., assignors to Nantucket Industries, Inc., New York, N.Y.

Continuation of Ser. No. 205,351, Mar. 3, 1994, abandoned, which is a continuation of Ser. No. 23,773, Feb. 22, 1993, abandoned. This application Oct. 14, 1994, Ser. No. 323,510

Int. Cl.[6] B65D *73/00*

U.S. Cl. 206—461 **39 Claims**

33. A system for packaging a plurality of pairs of intimate apparel of various styles, colors, sizes, and fabrics, comprising:



a first half and a second half molded of a transparent, semi-flexible plastic material;

each half comprising a dished out portion having a product receiving portion and an insert-receiving recess overlying said product receiving portion;

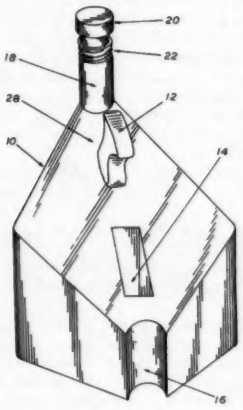
a plurality of inserts each having a front flap, a back flap, and a side flap integrally connecting said front flap and said back flap, wherein said front flap and said back flap of said insert have a periphery of a particular geometric shape whereby said particular geometric shape represents a particular style of product.

5,485,920

STACKABLE SPACE SAVING CONTAINER

Lawrence E. Fritz, 308 S. Mill St., Apt #207, Fergus Falls, Minn. 56537

Filed Aug. 30, 1994, Ser. No. 298,032
Int. Cl.[6] B65D *21/032;21/036*
U.S. Cl. 206—509 **10 Claims**



1. A stackable space saving container comprising:

a half rectangular body cut substantially diagonally from a corner edge to an opposite edge lower on the cube so as to define the body of said container;

a cylindrical neck extending from the upper edge of said body;

said body further having a portion along the lowest cut edge defining a cylindrical groove;

a handle on the upper half of the diagonal surface defined by said diagonal cut;

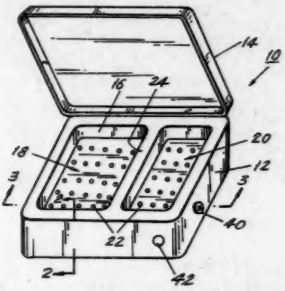
and said diagonal surface having on its lower half a portion defining an inward handle receptacle.

5,485,921

LUNCH BOX

Jacob M. Tolendano, Great Neck, N.Y., assignor to Aristo International Corporation, New York, N.Y.

Filed Sep. 22, 1993, Ser. No. 125,119
Int. Cl.[6] B65D *81/20*
U.S. Cl. 206—545 **9 Claims**



1. A lunch box for maintaining the temperature of stored food, comprising:

an external box housing defining within itself at least one compartment for storing food therein;

the compartment for storing food having inner wall surfaces, means formed on at least a portion of the inner wall surfaces for substantially preventing contact between food stored in the compartment and the inner wall surfaces of the compartment; and

a cover over the housing for enclosing the compartment, whereby transfer of heat between the stored food and the inner wall surfaces of the compartment is substantially eliminated; and

further comprising vacuum creating means in fluid communication with the compartment for creating a vacuum in the compartment.

9. A lunch box for maintaining the temperature of stored food, comprising:

an external box housing defining within itself at least one compartment for storing food therein;

the compartment for storing food having inner wall surfaces, means formed on at least a portion of the inner wall surfaces for substantially preventing contact between food stored in the compartment and the inner wall surfaces of the compartment;

a cover over the housing for enclosing the compartment; and

vacuum creating means in the housing in fluid connection with the inside of the compartment for creating vacuum in the compartment by evacuating substantially all of the air therein,

whereby a vacuum is created inside the compartment so as to releasably secure the cover to the housing and to maintain the inside of the compartment below atmospheric pressure.

5,485,922

PORTABLE COMPUTER CARRY CASE ASSEMBLY

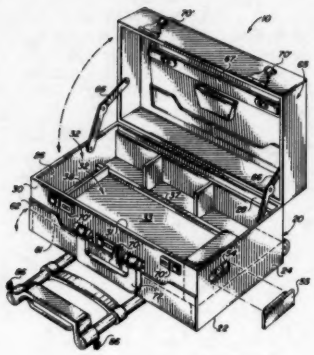
Robert A. Butcher, 2500 Parkview Dr., #616, Hallandale, Fla. 33009

Filed Oct. 14, 1994, Ser. No. 323,115
Int. Cl.[6] A45C *3/02;* **B65D** *85/38*
U.S. Cl. 206—576 **19 Claims**

1. To safely and securely contain and transport a portable computer and various accessories therefor, a portable computer carry case assembly comprising:

(a) a main housing including a bottom wall, a first side wall, a second side wall, a rear wall and a front wall defining an open top end and an interior of said main housing,

(b) a divider panel disposed in said interior of said main housing and defining a top compartment and a bottom compartment therein,



(c) said top compartment including:

a pair of spaced longitudinal support members structured and disposed to supportably receive the portable computer thereon such that a keyboard portion of the portable computer is co-planar with a top edge of said front wall of said main housing,

a pair of adjustably positionable latitudinal support members disposed in spaced apart relation from one another and extending between said spaced longitudinal support members so as to straddle the portable computer and prevent the portable computer from moving laterally within said top compartment,

at least one adjustable rear spacer extending from said rear wall of said main housing to a rearmost one of said pair of spaced longitudinal support members so as to securely maintain the portable computer between said front wall and said rear spacer,

said at least one adjustable rear spacer defining at least two auxiliary storage compartments between said rear wall and said rearmost one of said spaced longitudinal support members,

said pair of spaced longitudinal support members and said pair of adjustably positionable latitudinal support members defining a central storage compartment structured and disposed to safely and securely contain computer disks,

(d) a surge suppressor/power conditioner disposed within said interior of said main compartment, said surge suppressor/power conditioner including at least one electric cord outlet and an electric cord input,

(e) a power chord outlet opening disposed in one of said walls of said main housing so as to allow exterior access to said electric cord input of said surge suppressor/power conditioner,

(f) a connector access disposed in said divider panel so as to facilitate access between said top compartment and said bottom compartment,

(g) said bottom compartment being structured and disposed to contain a portable computer printer therein and including a main opening formed in said front wall of said main housing,

(h) a closure flap disposed in covering relation over said main opening of said bottom compartment, said closure flap being movable between a closed position wherein said main opening is substantially covered and an open position wherein said bottom compartment is accessible through said main opening,

(i) a lid hingedly secured to a top edge of one of said walls defining said main housing, said lid being movable between a closed position in covering relation atop said open top end and an open position exposing said top compartment through said open top end,

(j) latch means structured and disposed to secure said lid in said closed position and to secure said closure flap in said closed position,

(k) at least one wheel rotatably disposed on an exterior of said rear wall of said main housing, said wheel being structured and disposed to support said main housing thereon during rotation thereof so as to facilitate transportation of said main housing, and

(l) an extendable handle secured to said bottom wall of said main housing, said extendable handle being structured and disposed to be held by a user so as to maintain said main housing supportably atop said at least one wheel for facilitated transport pulling of said main housing.

15. To safely and securely contain and transport a portable computer and various accessories therefor, a portable computer carry case assembly comprising:

(a) a main housing including a bottom wall, a first side wall, a second side wall, a rear wall and a front wall defining an open top end and an interior of said main housing,

(b) a divider panel disposed in said interior of said main housing and defining a top compartment and a bottom compartment therein,

(c) said top compartment including:

a pair of spaced support members structured and disposed to supportably receive the portable computer thereon such that a keyboard portion of the portable computer is coplanar with a top edge of said front wall of said main housing,

stabilizing means structured and disposed to prevent the portable computer from sliding around within said top compartment,

(d) a surge suppressor/power conditioner disposed within said interior of said main compartment, said surge suppressor/power conditioner including at least one electric cord outlet and an electric cord input,

(e) a power chord outlet opening disposed in one of said walls of said main housing so as to allow exterior access to said electric cord input of said surge suppressor/power conditioner,

(f) a connector access disposed in said divider panel so as to facilitate access between said top compartment and said bottom compartment,

(g) said bottom compartment being structured and disposed to contain a portable computer printer therein and including a main opening formed in a front wall of said main housing,

(h) a closure flap disposed in covering relation over said main opening of said bottom compartment, said closure flap being movable between a closed position wherein said main opening is substantially covered and an open position wherein said bottom compartment is accessible through said main opening,

(i) a lid hingedly secured to a top edge of one of said walls defining said main housing, said lid being movable between a closed position in covering relation atop said open top end and an open position exposing said top compartment through said open top end,

(j) latch means structured and disposed to secure said lid in said closed position and to secure said closure flap in said closed position,

(k) at least one wheel rotatably disposed on an exterior of said rear wall of said main housing, said wheel being structured and disposed to support said main housing thereon during rotation thereof so as to facilitate transportation of said main housing, and

(l) an extendable handle secured to said bottom wall of said main housing, said extendable handle being structured and disposed to be held by a user so as to maintain said main housing supportably atop said at least one wheel for facilitated transport pulling of said main housing.

5,485,923

DRUM FOR PARTICULATE HANDLING WITH FINES COLLECTOR

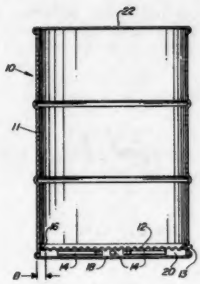
M. W. Schrepfer, Elk Grove Village, Ill., assignor to UOP, Des Plaines, Ill.

Filed Jul. 29, 1994, Ser. No. 282,449

Int. Cl.[6] B07B *1/00*

U.S. Cl. 209—235 **4 Claims**

1. A drum for holding particulate material, said drum comprising:



a cylindrical sidewall, a top and bottom defining an interior volume;

a screen located parallel to and above said bottom and extending toward said sidewall, said screen having openings smaller than said particulate material;

a spacer to support said screen from said bottom;

an angled ring having an inner edge sealed against the top of said screen and an outer edge located above said inner edge and encircling the inside of said cylindrical sidewall;

means for removing particulate material from said trap comprising a drain opening in the side of said drum.

5,485,924

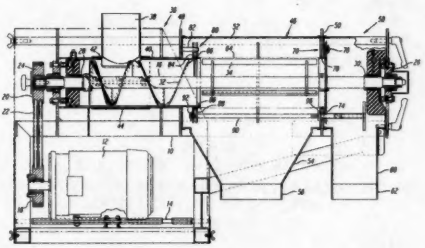
CENTRIFUGAL SIFTER AND ELEMENTS THEREOF

Jochim M. Zaun, Ft. Thomas, Ky., assignor to Sweco, Incorporated, Florence, Ky.

Filed May 9, 1994, Ser. No. 239,649

Int. Cl.[6] B07B *1/49*

U.S. Cl. 209—300 **8 Claims**



5. A screen clamp for a cylindrical screen of a centrifugal sifter, comprising

a circular bead attached at one end of the cylindrical screen;

a mounting plate having a cylinder extending laterally from one side of the mounting plate, the cylindrical screen extending closely over the cylinder;

a locking plate having a hole therethrough and being fixed to the mounting plate with the hole extending over the cylindrical screen and the cylinder, the circular bead being between the mounting plate and the locking plate and of greater diameter than the hole.

5,485,925

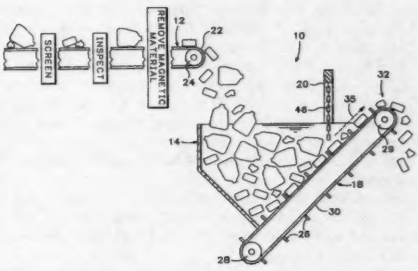
SYSTEM AND METHOD FOR SEPARATING RECYCLED DEBRIS

Roy R. Miller; Brian K. Clark, and Fred M. Austin, all of Eugene, Oreg., assignors to Bulk Handling Systems, Inc., Eugene, Oreg.

Filed Sep. 21, 1994, Ser. No. 310,265

Int. Cl.[6] B07C *5/36*

U.S. Cl. 209—615 **26 Claims**



1. A system for classifying recycled debris comprising light material and heavy material, said system comprising:

a hopper for receiving such debris, said hopper having a generally upwardly-directed inlet and a generally downwardly-directed outlet;

a conveyor having a generally upwardly-directed substantially planar surface urged against said hopper outlet;

a plurality of substantially rigid members mounted on said conveyor and extending into said hopper for carrying heavy material therefrom; and

a chain screen disposed over the conveyor for preventing the conveyor from carrying light material from the hopper by the conveyor.

5,485,926

STORAGE AND DISPLAY HOLDER

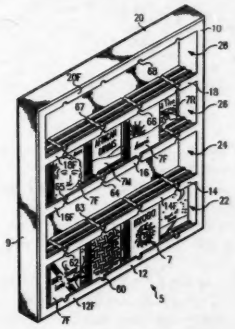
James W. Kundert, Sudbury, Mass., assignor to Andrew G. Dimock, Dallas, Tex.

Filed Apr. 28, 1994, Ser. No. 234,185

Int. Cl.[6] A47F *7/00*

U.S. Cl. 211—40 **17 Claims**

1. A storage and display unit for organizing a plurality of



articles, said articles having a substantially uniform height, a substantially uniform width and a substantially uniform thickness, said storage and display unit comprising:

a first horizontally extending member and a second horizontally extending member, each of said first and second horizontally extending members having a front side, a back side, a first end portion and a second end portion, said first and second horizontally extending members being positioned substantially parallel to each other and spaced apart by a distance greater than the height of said articles;

a first flange on said first horizontally extending member, said first flange extending from said first horizontally extending member toward said second horizontally extending member, said first flange being spaced from the back side of said first horizontally extending member by a distance greater than twice the thickness of one of said articles;

a second flange on said second horizontally extending member, said second flange extending from said second horizontally extending member toward said first horizontally extending member, said first and second flanges being positioned to define an opening therebetween through which said articles can be moved while inclined at an acute angle to said first and second flanges, said opening having a height which is less than the height of one of said articles, said opening having a width which is greater than twice the width of one of said articles,

a first row of articles located between the back side of said first horizontally extending member and said first flange; and

a second row of articles located between said first row of articles and said first flange,

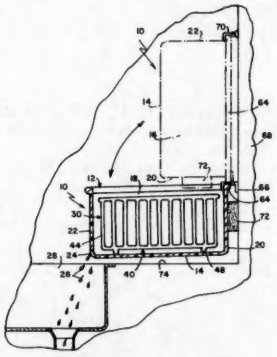
said articles of said first and second rows having a width greater than about ¼ an inch.

5,485,927

DRAINING AND DRYING DEVICE FOR UTENSILS

Michael W. Hubbard, 41C Manchester St., Lawrence, Mass. 01841

Filed Mar. 4, 1994, Ser. No. 205,835
Int. Cl.[6] A47F *5/00*
U.S. Cl. 211—41 **10 Claims**



1. A drainer device for draining and drying utensils adjacent to a sink basin comprising:

a base means including a bottom wall and perpendicular side, front and side walls;

an inner means insertable into the base means with a similar configuration of the base means for supporting utensils therein;

said base means and inner means having means for channelling water dripping from said utensils to the sink;

means for releasably attaching said base means to a wall adjacent to the sink basis; and

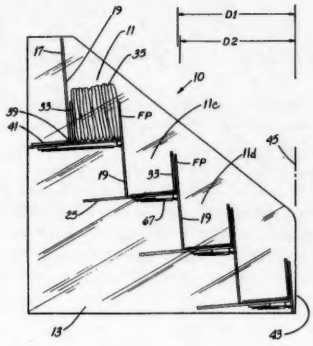
wherein said base means further includes a plurality of open sections positioned along the front portion of the bottom wall and the bottom portion of the front wall.

5,485,928

MERCHANDISE DISPLAY RACK

J. Reed Felton, Milwaukee, Wis., assignor to T. J. Hale Company, Menomonee Falls, Wis.

Filed Dec. 1, 1993, Ser. No. 159,520
Int. Cl.[6] A47F *5/00*
U.S. Cl. 211—52 **9 Claims**



1. A rack having a compartment for displaying products, the compartment having a rear panel, a front panel and a follower with a first panel portion mounted for movement toward the front panel when a product is removed from the compartment, the improvement wherein:

the rack includes a mechanism for moving the follower in the compartment;

the first panel portion and the front panel substantially abut one another when the compartment is emptied of products;

the first panel portion and the rear panel substantially abut one another when the compartment is filled with products;

when the compartment contains products, the first panel portion and the front panel support the products forward of the rear panel for display in a way that a product front surface may be easily observed when viewed from a location above the compartment; and

the follower has a second portion extending through a space to a location rearwardly of the rear panel when products are displayed in the compartment.

5,485,929

POINT OF PURCHASE DISPENSER

Joseph Danon, 580 Mountain Ave., North Caldwell, N.J. 07006

Filed Oct. 13, 1994, Ser. No. 322,696
Int. Cl.[6] B42F *13/00*
U.S. Cl. 211—57.1 **15 Claims**

1. A point of purchase dispenser comprising:

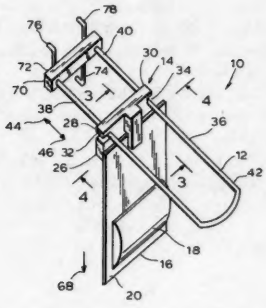
support means having a first end and a second end, first attachment means disposed on said first end of said support means,

a clip assembly, second attachment means disposed on said clip assembly for removable attachment of said clip assembly to said support means,

a first portion formed on said clip assembly,

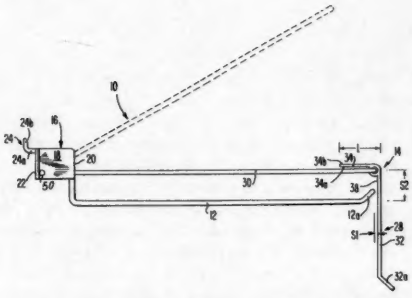
a second portion formed on said clip assembly, with said first and second portions spaced apart, thereby defining a slot between said first and said second portions,

ball means mounted on said second portion, and



resilient means mounted on said second portion, between said second portion and said ball means, with said resilient means urging said ball means to project through said slot and bear against said first portion.

5,485,930
ANTI-THEFT DISPLAY HOOK
Tatsuo Rushing, Denville, N.J., assignor to HMG Worldwide Corporation, New York, N.Y.
Filed Jul. 14, 1994, Ser. No. 274,959
Int. Cl.[6] B42F *15/00*
U.S. Cl. 211—59.1 **14 Claims**



1. A merchandise display device, securable to an upright member, for supporting a plurality of articles, each of said articles defining a centrally positioned aperture, comprising:

an elongated member having a distal end dimensioned and arranged for insertion into a respective aperture of each article, the articles being slidable along said elongated member into superposed relation;

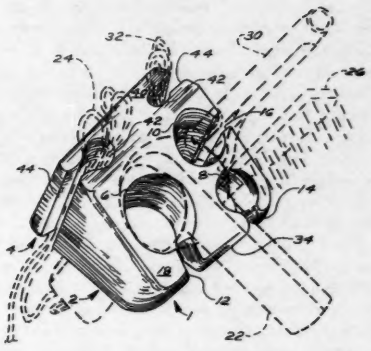
securing means for securing said elongated member to the upright member in an outwardly projecting manner; and

blocking means disposed proximate said distal end, said blocking means including a portion insertable between first and second adjacent articles on said elongated member so as to permit removal of the first adjacent article and prevent removal of the second adjacent article.

5,485,931
HAIR DRYER CADDY
John F. Barr, Jr., R.R. 3, Box 68, Delanson, N.Y. 12054
Filed Oct. 25, 1993, Ser. No. 141,774
Int. Cl.[6] A47F *7/00*
U.S. Cl. 211—70.6 **11 Claims**

1. A hair dryer holder assembly comprising:

a holder having a front section and a rear section;



said front section having a front surface, a first side surface, a second side surface, a top surface and a bottom surface;

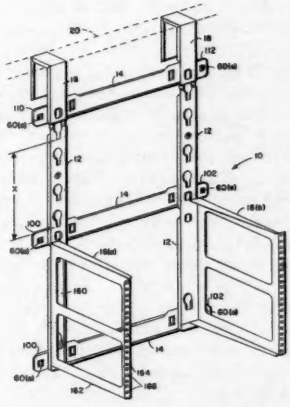
said rear section having a rear surface, a top surface and a bottom surface;

at least one bore located in the front section and extending between the top and bottom surface of said section, said at least one bore being open at top and bottom ends thereof, and wherein said at least one bore has a diameter capable of receiving a handle portion of a hair dryer;

at least one bore located in the rear section and extending between the top and bottom surface of said section, said at least one bore being open at top and bottom ends thereof, and wherein said at least one bore in said rear section is capable of receiving and storing a length of electrical cord; and

attachment means for attaching said holder to a support means.

5,485,932
WALL MOUNTABLE MODULAR COMPONENT MOUNTING SYSTEM
Michael Romm, Brighton; Robert A. Barker, Lunenburg, and Stuart K. Morgan, Westford, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed May 3, 1994, Ser. No. 237,517
Int. Cl.[6] A47F *5/00*
U.S. Cl. 211—87 **7 Claims**



1. A wall mountable modular component mounting system comprising:

wall rails each made of rigid material having a thickness dimension "t" and configured for interlocking engagement with each

other at opposite ends, each rail comprising an elongated central portion and an upstanding wall portion at each of the longitudinal edges of such elongated central portion, the upstanding wall portions extending away from the elongated central portion on the same side of the rail to maintain such central portion in spaced apart relationship with a wall on which the system is mounted, the central portion having opposing elongated major surfaces, the elongated major surface on the side of the rail opposite the upstanding wall portions being outwardly facing surface when the system is mounted on a wall and the other major surface being inwardly wall facing surface, the outwardly facing surface including a main surface portion, an end surface portion narrower in width than the main surface portion, and a transition surface portion, the end surface portion terminating one end of the rail, such end surface portion being parallel to and laterally offset from the main surface portion a distance substantially equal to the thickness dimension "t" in a direction placing the main surface portion further from a wall than the end surface portion when the system is mounted on a wall, the adjacent ends of the end surface portion and of the main surface portion being connected by the transition surface portion, such transition portion extending in inclined relationship with the main and end surface portions, the rail having a hanging/mounting opening through the rigid material at the end of the rail having the end surface portion, such opening being shaped to include a central space with a width dimension "w" and a generally rectangular hanging slot aligned with a mounting slot, the central space extending lengthwise of the rail in the end surface portion and across the transition surface portion, each of the aligned slots being defined by two generally parallel side edges separated by a distance "d" that is smaller in dimension than the width dimension "w" of the central space and an end edge, the aligned slots being in communication with the central space on opposite sides thereof and extending lengthwise of the elongated central portion with the mounting slot being located entirely in the main surface portion and the hanging slot being located entirely in the end surface portion, a pair of wings of rigid material having a thickness dimension "t" located at the other end of the rail, the wings being mounted on the rail in spaced apart parallel relationship with the inwardly wall facing surface to define two generally parallel channels extending lengthwise of the elongated central portion, the channels each having a height dimension "h" greater than the thickness dimension "t" and the wings having a span dimension "s" greater than the distance dimension "d", the end surface portion of each of the rails being sufficiently narrower in width than the width of the other end of each of the rails to allow the inwardly wall facing surface at the other end of a first rail to be placed in contact and in an interlocking position with the end surface portion of a second rail with the upstanding wall portions of the other end of the first rail having its wings located in an immediately outside adjacent relationship with the upstanding wall portions of the end surface portion of the second rail, the wing extending through the central opening of the second rail to the inwardly wall facing surface side of the first rail for movement of the rails relative to each other to establish an interlocking .relationship between the wings of the first rail and rigid material of the second rail defining the hanging slot.

5,485,933

SHELVING SUPPORT SYSTEM

Rene W. Crooymans, 249 Belgrave-Gembrook Road, Clematis Victoria, Australia

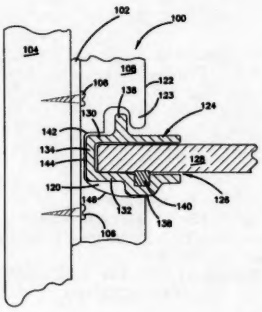
PCT No. PCT/AU93/00363, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO94/02050, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 21, 1993, Ser. No. 162,206

Claims priority, application Australia, Jul. 22, 1992, PL3648/92

Int. Cl.[6] A47F 5/08

U.S. Cl. 211—90 **7 Claims**



1. A support system for a shelf, said support system being attached to a fixture, said support system comprising:

a plurality of normally vertical, columnar supports, each of said columnar supports having a back adapted for attachment to the fixture and at least one longitudinally-extending flange attached to the back, extending forward therefrom and terminating in a front edge, each of said flanges having a cutout formed along its length, each cutout opening into said front edge, extending rearward therefrom and being shaped so that the upper and forward part of its periphery defines a downwardly-extending upper-lip of flange material, and

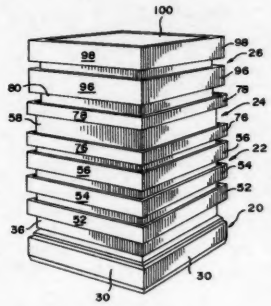
means for supporting said shelf, said supporting means including a linear extrusion, said extrusion being oriented normally-horizontal and fitting into a plurality of said cutouts, each extrusion having integral upper, rear and lower walls defining (in section) a forwardly-extending and forwardly-opening shelf-slot which extends along the extrusion and is thereby adapted to receive the rear edge of the shelf to be supported thereby, each of said extrusions also having an upwardly extending thumb-strip formed integrally with said upper wall of the extrusion near the forward open end of said shelf-slot and adapted for location behind said upper lip when the extrusion is placed within said cutout,

whereby, the extrusion may be inserted rearwardly into one of the cutouts by first tilting the extrusion up and back to allow said thumb-strip to pass behind said upper-lip and then tilting the extrusion down and forwards until the forward face of said thumb-strip contacts the upper-lip and the lower and/or rear walls of the extrusion make contact with the periphery of the cutout.

5,485,934
MERCHANDISE DISPLAY ASSEMBLY

William J. Holztrager, Chilhowie, Va., assignor to Display Systems, Inc., Chilhowie, Va.

Filed Jun. 16, 1993, Ser. No. 76,049
Int. Cl.[6] A47B *43/00*
U.S. Cl. 211—194 18 Claims



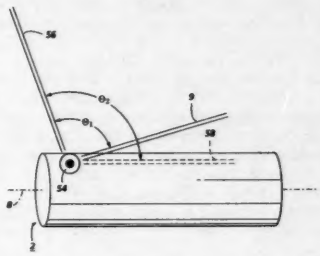
1. A merchandise display assembly, comprising:
a) a plurality of modular sections adapted to be assembled in stacked relationship;
b) each of said modular sections including a plurality of side members;
c) each of said members comprising a body portion having outer and inner surfaces, lateral edge portions and top and bottom edges;
d) said lateral edge portions of each side member being joined together to another side member to form a closed section of geometrical configuration;
e) said top and bottom edges of one said side member being adapted for interfitting with said top and bottom edges of another side member to form the stacked relationship of said modular sections;
f) a plurality of ribs extending outwardly from the outer surface of said modular sections in spaced relationship to each other;
g) a plurality of spaced parallel flange members secured respectively to said ribs, each of said flange members extending vertically; and
h) said ribs and flange members being adapted for securing a merchandise for display.

5,485,935
CAPTURE SYSTEM EMPLOYING DIVERTER FLUID NOZZLE

Robert S. Foltz, Rochester, and Ronald A. Gaither, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1994, Ser. No. 222,158
The portion of the term of this patent subsequent to Oct. 24, 2012, has been disclaimed.
Int. Cl.[6] B055 *3/06;* H01L *21/306;* B23K *26/00;* A47L *5/14*
U.S. Cl. 216—65 10 Claims

1. A method comprising:
(a) enclosing a portion of the length of a coated substrate in a housing to result in an enclosed coated substrate portion, wherein there exists a gap between the enclosed substrate portion and the housing and the gap is in communication with air outside the housing;
(b) directing radiation at the coating of the enclosed substrate portion;
(c) directing a first fluid stream against the coating of the enclosed substrate portion to remove at least part of the coating in the form of coating debris during or subsequent to (b), whereby the first fluid stream moves a portion of the coating debris outside the housing in the absence of (d);

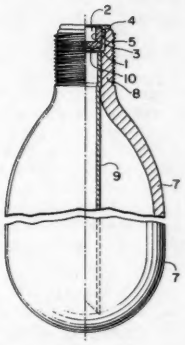


(d) directing a second fluid stream against the first fluid stream in a direction effective for keeping the coating debris inside the housing, thereby minimizing movement of the coating debris into the air outside the housing;
(e) exhausting the coating debris;
(f) directing a coaxial fluid stream which is coaxial with the radiation during (b) and
(a) rotating the substrate during (b).

5,485,936
SEALING PLATE WITH A FILTER FOR A HIGH PRESSURE LIQUIFIED GAS CARTRIDGE HAVING A SYPHON TUBE

Masao Sato, Koshigaya, Japan, assignor to Nippon Tansan Gas Company Limited, Tokyo, Japan

Continuation of Ser. No. 6,617, Jan. 21, 1993, abandoned.
This application Jun. 8, 1994, Ser. No. 255,301
Claims priority, application Japan, Jan. 20, 1992, 4-027473
Int. Cl.[6] B65D *51/16*
U.S. Cl. 220—371 2 Claims



1. A sealing plate and filter combination sealing a cartridge containing a liquified gas content under pressure and having a neck with an opening and a syphon tube extending from said neck internally of the cartridge; said sealing plate comprising;
a plate, having a side surface with an annular mounting bracket in fixed assembly with a powdered metal cylindrical filter, said filter having a blind bore with one end open and being disposed on the side surface mounting bracket of said plate and said open end being closed by said side surface of said plate so that an interior space in the filter is defined by the bore of the filter and said plate;
said side surface having an integral annulas centrally disposed thereon and projecting therefrom and into which said filter is pressed as fitted fixedly assembling the filter to said plate with an inner cylindrical surface of said annular disposed circumferentially of the cylindrical filter;

said side surface having a peripheral marginal portion circumferentially of said integral annular centrally disposed thereon;

said plate being mountable in use with the peripheral marginal portion overlying said neck and being sealed thereto and closing the neck opening; and said filter with said integral annular circumferentially of the filter extending into said neck toward the syphon tube enabling the outflow of said liquified gas content of the cartridge via said syphon tube and said filter into said interior space of the filter; and said sealing plate consisting of a pierceable material to selectively provide an opening thereon in communication with the interior space of the filter to provide a filtered outflow of the liquified gas content from said cartridge when the cartridge is mounted on a system.

5,485,937

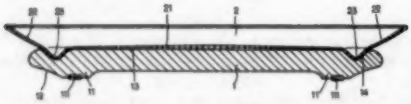
SANITARY CHOPPING PLATE STRUCTURE

Cheng-Tzu Tseng, No. 172, Wu-Chi Road, Wu-Chi Town, Taichung Hsien, Taiwan, Prov. of China

Filed Aug. 2, 1994, Ser. No. 284,854

Int. Cl.[6] B65D *43/00*

U.S. Cl. 220—571 **8 Claims**



1. A sanitary chopping plate Structure, comprising a bottom disk and at least one chopping plate, wherein

a plurality of feet being provided around the lower edge of said bottom disk,

an inclining surface being formed between each said foot and the top edge of said bottom disk,

a plain plane being formed by the top surface of said bottom disk,

and a groove being provided around the periphery of said plain plane; further,

said chopping plates each being formed of a thin slice which is declined from its center area toward its periphery and then raised again to its end edge to form another inclining surface, a water collecting groove thus being formed at the periphery of said slice and being corresponding to said groove of said bottom disk, said groove and said water collecting groove of each slice being matched and being put together, different slices being interchangeable in a simple and quick mode to be matchably and firmly put on said bottom disk.

5,485,938

CUP LID ASSEMBLY

Drew H. Boersma, 2100 Woodley Creek, Comstock Park, Mich. 49321

Filed Mar. 24, 1995, Ser. No. 410,059

Int. Cl.[6] A47G *19/22*

U.S. Cl. 220—714 **25 Claims**

1. A resealable cup and lid assembly comprising:

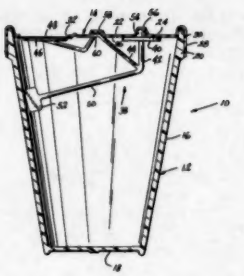
a cup having a flexible side wall and an opening provided on one end of the side wall;

a lid provided on the opening of the side wall, the lid comprising:

a base having a bottom surface;

a fluid opening provided in the base; and

a valve member provided on the bottom surface of the base adapted for movement between open and closed positions, the valve member having a first arm connected to the base, a flapper valve element connected to the first arm and adapted to selectively close the fluid opening and an articulation arm



having one end connected to the first arm and the other end positioned closely adjacent the flexible side wall of the cup;

wherein the valve member is moved between the closed and open positions by squeezing the cup side wall adjacent the articulation arm a sufficient distance to cause movement of the articulation arm and flapper valve element relative to the fluid opening.

5,485,939

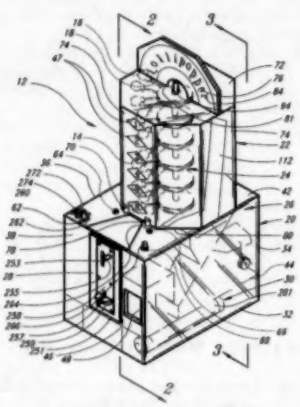
LOLLIPOP DISPENSER APPARATUS

Gary D. Tucker, 304 Otis St., Lakewood, Colo. 80226

Filed Nov. 9, 1994, Ser. No. 336,836

Int. Cl.[6] G07F *11/00*

U.S. Cl. 221—86 **26 Claims**



1. A lollipop dispenser apparatus operable to hold, display, and selectively dispense lollipop members therefrom, comprising:

a) a main support housing having a dispenser housing assembly mounted thereon;

b) a product support and dispensing assembly including a product support and display assembly connected to a product dispensing assembly;

c) said product support and display assembly having a product support and anchor assembly operable to receive and support a plurality of said lollipop members;

d) a product accounting and control assembly operably connected to said product support and dispensing assembly operable to assure positive dispensing of a lollipop member;

e) an electrical control circuit connected to said product support and display assembly;

f) a coin acceptor, selector, and dispenser assembly connected to said electrical control circuit operable, on receiving an impluse signal, to engage said product support and display

assembly to dispense a lollipop member from said main support housing assembly; and

g) said product accounting and control assembly having a product trip lever assembly engaged by a dispensed one of the lollipop members to cease power to said impulse signal to stop a lollipop dispensing operation only after the lollipop member has been dispensed.

5,485,940

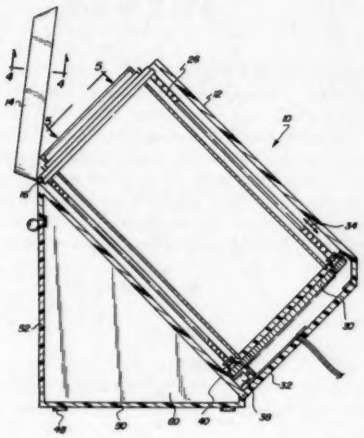
BREAD BOXES WITH SLICE DISPENSING MECHANISMS

Rickie L. Hernandez, 48617 36th Ave., Bangor, Mich. 49013

Filed Apr. 11, 1994, Ser. No. 225,764

Int. Cl.[6] B65H *3/00*

U.S. Cl. 221—192 **3 Claims**



1. A new and improved bread box for storing sliced bread and for dispensing or replacing such sliced bread one or more slices at a time comprising, in combination:

four side walls oriented in a rectangular configuration about a central vertical axis, a lower base coupling the lateral edges of the side walls, and a lid with a hinge coupled to the top edge of one of the side walls and pivotable from a raised upper orientation having a steel rim for receiving a magnetic gasket located in the top of the outer casing's lid;

a bail mounted on the top side of an invertor collar and hinged to swing in the same direction as the lid on the outer casing, the bail and collar capable of reciprocating along the axis, the bail and collar also capable of enclamping the open end of a bread wrapper;

a pair of parallel worm gears extending parallel with respect to the axis of a box gearing associated with the worm gears capable of receiving collar guides, part of the invertor collar and bail assembly whereby when the guides are on the invertor collar follow a spiraling groove in the worm gears as they are rotated the invertor collar will move up or down to the desired number of bread slices;

a pair of planet gears at the bottom edge of each worm gear with a sun gear rotatable about the axis of the box to rotate the planet gears; and

a power source coupled to the sun gear for rotating the sun gear whereby rotation of the sun gear will rotate the planet gears, the parallel worm gears to move the invertor collar upward or down as will the enclamped bread wrapper downward from over the top rim of the inner bread box thus inverting the wrapper and exposing the contents.

5,485,941

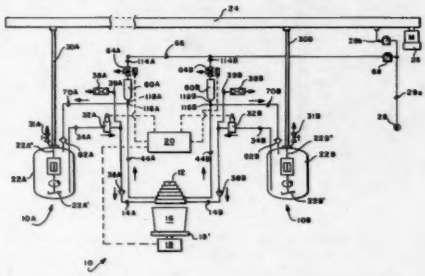
RECIRCULATION SYSTEM AND METHOD FOR AUTOMATED DOSING APPARATUS

Daniel Guyomard, Lamorkoye, France; James L. Anderson, Jr., Howell, Mich.; Alfred Frank, Toledo, Ohio, and Georges Chavaillaz, Saint Sulpice, Switzerland, assignors to BASF Corporation, Mt. Olive, N.J., and Cydec S.A., Switzerland

Filed Jun. 30, 1994, Ser. No. 268,929

Int. Cl.[6] B67D *5/08*

U.S. Cl. 222—1 **19 Claims**



1. In an automated dosing apparatus having a dosing head for dispensing a dose of flowable material, a supply canister for maintaining a supply of the flowable material under a pressure P_1, a supply line which fluid-connects the supply canister to the dosing head, and a flow valve disposed in the supply line having at least closed and opened conditions which respectively prevent and allow the flowable material to flow to the dosing head, the improvement comprising a recirculation system which recirculates the flowable material during a recirculation mode to the supply canister, said recirculation system comprising:

a buffer reservoir;

a recirculation channel within the dosing head which is fluid-connected to the supply line;

a recirculation line which fluid-connects the recirculation channel to the buffer reservoir:

a transfer line which fluid-connects the buffer reservoir and the supply canister;

a source of pressurizing fluid at a pressure P_2 greater than the pressure P_1 of the supply canister;

a control valve operatively interconnecting the buffer reservoir to the source of pressurization fluid and having a vent condition wherein the buffer reservoir is vented and a pressurization condition wherein the buffer reservoir is fluid-connected to the source of pressurization fluid; and

an automated controller operatively connected to the flow and control valves for (i) initiating a recirculation mode by issuing a first signal to cause the flow valve to assume its opened condition and thereby allow the flowable material to flow through the recirculation line to the buffer reservoir, whereby a volume of recirculated flowable material is accumulated within the buffer reservoir, and thereafter (ii) initiating a transfer mode by issuing a second signal to cause the control valve to assume its pressurization condition, the buffer reservoir being pressurized by the pressurization fluid in response to the control valve assuming the pressurization condition to thereby cause the volume of recirculated flowable material within the buffer reservoir to be transferred to the supply canister.

5,485,942

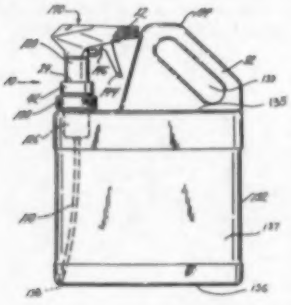
LIQUID DISPENSER ASSEMBLY WITH CONTAINER HAVING A SLOPED HANDLE

Donald D. Foster, St. Charles, Mo., assignor to Contico International, Inc., St. Louis, Mo.

Division of Ser. No. 227,565, Apr. 14, 1994, Pat. No. 5,373,973, which is a continuation of Ser. No. 984,876, Dec. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 829,759, Jan. 31, 1992, abandoned. This application Dec. 19, 1994, Ser. No. 358,692

Int. Cl.[6] B67D *5/42*

U.S. Cl. 222—324 **15 Claims**



1. In combination, a container and a sprayer dispenser having a dip tube, the combination comprising:

a sprayer dispenser having a dip tube;

a container body having a top wall and a bottom wall and at least one sidewall extending between the top wall and bottom wall, the top wall, bottom wall and sidewall all surrounding an interior volume of the container;

an opening in the top wall of the container, the opening being dimensioned to receive the dip tube of the sprayer dispenser therethrough;

means on the container for securing the sprayer dispenser on the top wall of the container with the dip tube inserted through the top wall opening; and,

a crown formed in a portion of the container top wall adjacent the top wall opening, the crown projecting from the top wall adjacent to an beyond the sprayer dispenser when the sprayer dispenser is secured to the container top wall.

5,485,943

HANGER WITH IRREMOVABLE INFORMATION TAB

Andrew M. Zuckerman, Forest Hills, N.Y., assignor to Different Dimensions Inc., Rego Park, N.Y.

Division of Ser. No. 42,811, Apr. 5, 1993, Pat. No. 5,383,583, which is a division of Ser. No. 801,613, Nov. 22, 1991, Pat. No. 5,199,608, which is a continuation of Ser. No. 591,621, Oct. 2, 1990, abandoned. This application Jan. 24, 1995, Ser. No. 377,189

Int. Cl.[6] A47G *25/14*

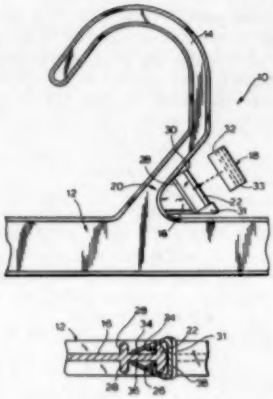
U.S. Cl. 223—85 **17 Claims**

16. A garment hanger including a tab, comprising:

a hanger including a body and a hook member connected to said body;

a tab holder, formed integrally with said hanger, said tab holder having two opposite sides and a free edge, a ridge disposed parallel to said free edge and extending from said two opposing sides, an upper end member formed above said ridge and a lower end member formed below said ridge; and

a tab defining a face member and two opposing sides, each of said two opposing tab sides extending from said face member and terminating in a foremost edge opposite said face member, each of said opposing tab sides having an inwardly projecting portion for engaging said ridge to secure said tab to said tab holder, said face member and said two opposing tab sides forming an upper edge surface and a lower edge surface, said upper and lower end members of said tab holder being located relative to said respective upper and lower edge surfaces of said tab such that, when said tab is located on to said tab holder, said upper and lower end members obstruct access to said respective upper and lower edge surfaces, said upper and lower end members of said tab holder extending substantially the full length of said upper and lower edge surfaces of said tab.



5,485,944

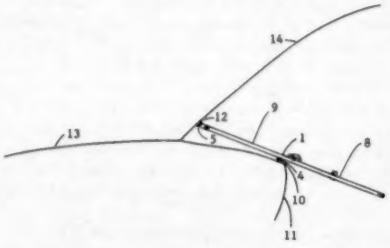
PORTABLE WRITING PLATFORM FOR VEHICLES

Robert C. Kauffman, 342 Windemere Ave., Lansdowne, Pa. 19050

Filed Mar. 18, 1994, Ser. No. 214,536

Int. Cl.[6] B60R *7/00*

U.S. Cl. 224—277 **5 Claims**



1. A device for mounting a note pad in a vehicle having a windshield and a dashboard, said device comprising:

an elongated base having a front end, a back end, a top surface defining a writing area, and a bottom surface;

clamp means on said base top surface for removable retaining said note pad against said top surface writing area;

first fastener means attached to the base bottom surface and the dashboard for securing the base to the dashboard;

second fastener means attached to the base back end and the windshield; wherein

when pressure is applied to said writing area the base pivots from a first position in which the base back end is substantially parallel to a plane defined by said dashboard to a second position where the base back end is wedge between said dashboard and said windshield and is held in a locking position by said second fastener means.

5,485,945

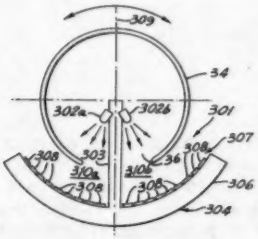
OPENING APPARATUS HAVING AN ALIGNMENT SYSTEM FOR PRODUCING A CONTINUOUS METAL STRIP FROM A SPLIT-TUBE

Thomas L. Linsenbardt, Loman, Mo., and Daniel H. Hickman, Florence, S.C., assignors to ABB Power T&D Company Inc., Raleigh, N.C.

Division of Ser. No. 121,613, Sep. 15, 1993, Pat. No. 5,406,818, which is a continuation-in-part of Ser. No. 791,103, Nov. 12, 1991, Pat. No. 5,359,874. This application Jan. 25, 1995, Ser. No. 378,200

Int. Cl.[6] B65H *23/02*

U.S. Cl. 226—10 **11 Claims**



1. Apparatus for aligning a tube having an opening in the periphery thereof such that the opening is at a desired angular position, which comprises:

means within the tube for directing light radially outward towards an area encompassing the desired position of the opening, light emanating from the tube if at least part of the opening is within the area, a characteristic of the emanated light being a function of the actual position of the opening relative to the desired position thereof;

means for sensing the light emanating from the tube;

means selectively operatable for rotating the tube; and

means responsive to the light sensing means for controlling the operation of the rotating means to rotate the tube into a position in which the opening is at the desired orientation.

5,485,946

RELEASE LOCKING MEANS OF A DRIVING TOOL FOR FASTENERS

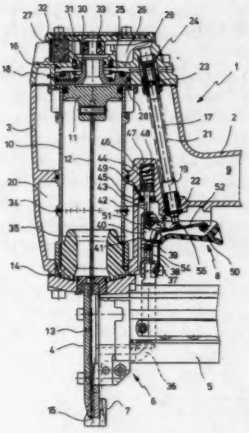
Bernd Jankel, Ahrensburg, Germany, assignor to Joh. Friedrich Behrens AB, Ahrensburg, Germany

Filed Apr. 15, 1994, Ser. No. 237,206

Claims priority, application Germany, Apr. 16, 1993, 9305760 U

Int. Cl.[6] B25C *1/04*

U.S. Cl. 227—8 **10 Claims**



1. A pneumatically operated driving tool, comprising a working cylinder (**10**) with a working piston (**11**) being movable between an upper and a lower dead center, a drive-in tappet (**12**) mounted on said working piston, a control valve array (**18**), which, when actuating a valve rod (**17**), connects a working stroke space above said working piston to compressed air for moving said piston to the lower dead center and, when releasing said valve rod, connects the working stroke space to atmosphere for moving said piston to the upper dead center, a piston return chamber (**20**) surrounding said working cylinder, said piston return chamber being connected to said working cylinder via a first opening (**35**) adjacent to the lower dead center and via a second opening (**34**) spaced apart from the lower dead center, a mouth tool (**4**) comprising a drive-in channel (**13**) guiding said drive-in tappet, an outlet and a moving area for the drive-in tappet, a magazine (**5**) for fasteners having an opening, said magazine opening being adjacent to the moving area of said drive-in tappet, a sensing means (**6**) comprising a sensor head (**7**) which extends below the outlet (**15**) of said mouth tool and is axially slidably movable and a sensor slide portion (**37**) connected to the sensor head and an abutment portion (**41**), which extends transversely to the sensor slide portion's direction of displacement, the pneumatically operated driving tool further comprising a trigger lever (**8**) for displacing said valve rod (**17**) comprising a pivotally mounted valve lever (**50**) having a free end and a pivotally mounted end and a control lever (**52**) mounted thereon and facing said valve rod, said control lever (**52**) being pivotally mounted adjacent to the free end of said valve lever and having a free control lever end (**53**) adjacent to the pivotally mounted end of said valve lever, wherein said free control lever end is supported by said abutment portion (**41**) before displacement of the sensor head, whereby displacing said sensor head (**7**) by placing the tool upon a workpiece the sensing means is actuated, prior to actuating said trigger lever (**8**), which is accomplished by pivoting said valve lever (**50**) towards said valve rod (**17**), said free control lever end remains supported by said abutment portion (**41**) when first actuating said sensing means (**6**) thereafter, when actuating said trigger lever (**8**) so that said control lever (**52**) actuates said valve rod (**17**), said free control lever end slips from said abutment portion (**41**) so that when actuating said trigger lever (**8**) after the initial trigger lever actuation without first actuating said sensing means (**6**), said valve rod (**17**) is not being further displaced by said control lever (**52**), the operating tool further comprising a locking means (**44**, **46**) being associated to said sensing means (**6**), wherein said sensor slide portion (**37**) is connected to a movable locking piston (**44**) within a locking cylinder (**46**), wherein said locking piston (**44**) is loaded with working pressure forcing the locking piston in the direction in which the sensor slide portion (**37**) is actuated for locking and is aerated for unlocking, the sensing means being locked by the locking means in the sensing means' operated position in response to actuating said valve rod (**17**) and unlocks said sensing means when releasing said valve rod.

5,485,947

LINEAR STAPLING MECHANISM WITH CUTTING MEANS

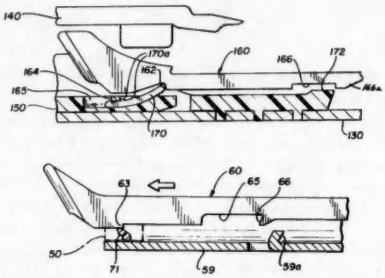
Todd Olson, Loveland; Dan Meiser, Oxford; Gary Steed, Cleves; Eric Huffman, Loveland; Matthew Otten, Cincinnati; Ronald VanOverloop, West Chester; Darrel Powell, Cincinnati; Thomas Knodell, Loveland; Edward Rhad, Fairfield; Ralph Chen, Cincinnati, and Robert Cook, West Chester, all of Ohio, assignors to Ethicon, Inc., Somerville, N.J.

Continuation of Ser. No. 917,636, Jul. 20, 1992, Pat. No. 5,307,976, which is a continuation-in-part of Ser. No. 779,436, Oct. 18, 1992, abandoned. This application Mar. 18, 1994, Ser. No. 215,075

The portion of the term of this patent subsequent to Oct. 10, 2011, has been disclaimed.

Int. Cl.[6] A61B *17/072*

U.S. Cl. 227—176.1 **22 Claims**



1. A surgical stapler for endoscopic application comprising:

a handle portion, a shaft portion, and a stapling portion connected to the handle portion by said shaft portion,

said stapling portion having a stapling assembly including a replaceable staple-filled staple cartridge, and a movable anvil operable to cooperate with said staple cartridge to clamp and staple tissue disposed therebetween,

said stapling assembly including at least one firing wedge movable distally along a longitudinal axis of said staple cartridge for firing staples therein, and knife means movable distally of said staple cartridge for cutting tissue clamped by said anvil said knife having a first edge portion near said cartridge and a second edge portion near said anvil,

said stapler assembly including a lockout mechanism for preventing refiring of said stapler, including notch means defined along said first edge portion of said knife means, said knife means being movable in a direction generally perpendicular to said longitudinal axis so that said notch means is movable from a first disengaged position to a second engaged position;

said lockout mechanism further including a movable lockout member mounted on said staple cartridge and engageable with said first edge portion,

said lockout member being movable from a first position to a second position during movement of said knife means relative to said cartridge, wherein in said first position of said lockout member, said notch means is disposed in said first disengaged position so that said knife means is movable distally of said staple cartridge, and in said second position of said lockout member, said notch means is positionable in said second engaged position when said knife means is moved proximally to a retracted position when said knife means is moved proximally to a retracted position, wherein said notch means prevents distal movement of said knife means to prevent refiring of said stapler.

5,485,948

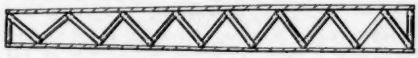
SHAFT AND METHOD OF MAKING SAME

Edward J. McCrink, P.O. Box 1429, Rancho Sante Fe, Calif. 92067

Filed Jul. 26, 1993, Ser. No. 97,466

Int. Cl.[6] B23K *101/04;31/02*

U.S. Cl. 228—126 **2 Claims**



1. A reinforced stainless steel shaft comprising:

a tubular shaft made from air hardening stainless steel;

a coil of air hardening stainless steel wire, said coil forming a tight fit between the outside diameter of the coil and the internal diameter of the shaft; and

brazing material proximal to the loci of intersections of the coil with the tubular shaft.

5,485,949

CAPILLARY FOR A WIRE BONDING APPARATUS AND A METHOD FOR FORMING AN ELECTRIC CONNECTION BUMP USING THE CAPILLARY

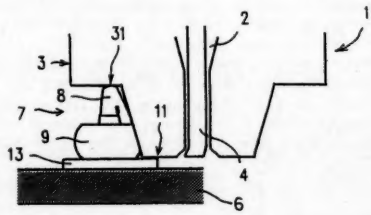
Yoshihiro Tomura, Hirakata, and Yoshihiro Bessho, Higashiosaka, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 26, 1994, Ser. No. 233,829

Claims priority, application Japan, Apr. 30, 1993, 5-103848; Jun. 8, 1993, 5-137090

Int. Cl.[6] H01L *21/603*

U.S. Cl. 228—180.5 **19 Claims**



1. A capillary for ball bonding for forming a bump on an electrode pad of a semiconductor device, said capillary comprising:

a pressing member including a tip face for pressing a ball-like end of a metal wire against said electrode pad to secure said ball-like end to said electrode pad under pressure;

a bore, provided in said pressing member, for supplying said metal wire; and

a leveling member for making said bump formed on said electrode pad a predetermined height, said leveling member including a bottom face for pressing said bump, wherein said bottom face is positioned a predetermined distance from said tip face to define the predetermined height of said bump.

5,485,950

COMPOSITE MATERIAL, PROCESS FOR PRODUCING COMPOSITE MATERIAL, AND PROCESS FOR PRODUCING COMPOSITE MATERIAL MOLDING

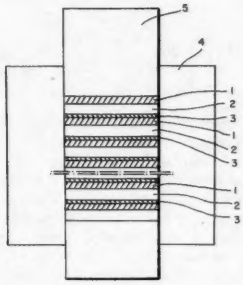
Kenichiro Shibata; Toshiyuki Hatta; Fumio Matsuyama; Masahiro Miyamoto; Manabu Okui, and Masaya Nishi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 83,291, Jun. 29, 1993, abandoned. This application May 25, 1995, Ser. No. 450,396

Claims priority, application Japan, Jun. 29, 1992, 4-211969; Dec. 12, 1992, 4-360729

Int. Cl.[6] B23K *20/02;20/14*

U.S. Cl. 228—194 **18 Claims**



1. A process for producing a composite material, comprising:

providing a first plate and a second plate, said first plate comprising a magnetic metal and said second plate comprising aluminum or an aluminum alloy, wherein at least one of said first plate and said second plate has a metal layer formed on a surface thereof, said metal layer having a melting point which is the same as a melting point of either the first or second plates or between said melting points of the first and second plates, respectively,

positioning the plates so that the metal layer is interposed between them, and

cladding the plates by an axial hot pressing under a reduced pressure of 10^{-1} Torr or less at a temperature of from 300° to 450° C.

5,485,951

COLLAPSIBLE CONTAINER

Ronald W. Phillips, Durand, Ill., assignor to Longview Fibre Company, Longview, Wash.

Filed Apr. 4, 1995, Ser. No. 416,197

Int. Cl.[6] B65D *5/10*

U.S. Cl. 229—156 **1 Claim**

1. A collapsible container formed from a blank of foldable sheet material, comprising:

(a) a plurality of upright first wall panels;

(b) a plurality of upright second wall panels;

(c) a plurality of upright corner panels;

(d) each said corner panel foldably connected to and disposed between a first wall panel and a second wall panel;

(e) said first wall panels, said second wall panels, and said corner panels acting together to define a predetermined area;

(f) bottom forming side flaps foldably connected to bottom edges of said first wall panels and extending therefrom towards one another into said predetermined area, said side flaps extending laterally beyond said first wall panels;

(g) bottom forming end flaps foldably connected to bottom edges of said second wall panels, and extending therefrom towards one another into said predetermined area, portions of said end flaps overlying portions of said side flaps when both said end flaps and said side flaps are respectively extending towards said predetermined area;

(h) each said end flap being divided into an inner and outer portion by a fold line;

(i) a pair of oppositely disposed notches on either side of each of said end flaps, said notches being aligned with said fold line and being configured to allow the portion of said end flap defined by said fold line to fit between said side flaps; and

(j) said outer portion of each said end flap forming a locking element that fits behind said side flaps when said outer portion is bent along said fold line relative to said inner portion and said side flaps are inserted into said notches.

5,485,952

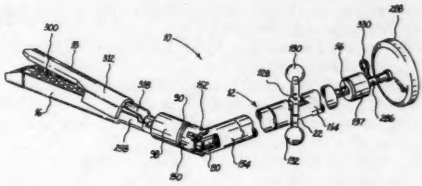
APPARATUS FOR APPLYING SURGICAL FASTENERS

Diego Fontayne, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Sep. 23, 1992, Ser. No. 950,065

Int. Cl.[6] A61B *17/072*

U.S. Cl. 227—178.1 **30 Claims**



1. Apparatus for driving surgical fasteners comprising:

a) a body having a proximal portion and an articulating distal portion;

b) linkage structure extending between said proximal portion and said distal portion of said body and operatively associated with said proximal portion of said body for moving said distal portion relative to a longitudinal axis of said proximal portion;

c) a cartridge assembly mounted adjacent said articulating distal portion and having a tissue engaging surface thereon;

d) an anvil member having a fastener forming surface thereon, said anvil member mounted adjacent said cartridge assembly for relative movement between an open position wherein said fastener forming surface is spaced from said tissue engaging surface and a closed position wherein said fastener forming surface is in close cooperative alignment with said tissue engaging surface;

e) camming means associated with said articulating distal portion for moving said anvil member between said open position and said closed position; and

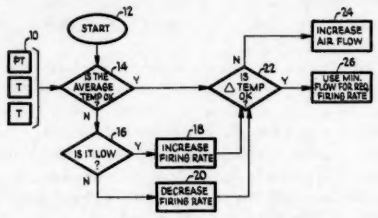
f) means for ejecting said surgical fasteners from said cartridge assembly to form against said fastener forming surface of said anvil member.

5,485,953

METHOD AND APPARATUS FOR CONTROLLING THE CIRCULATION OF HEAT TRANSFER FLUID FOR THERMAL CONDITIONING SYSTEMS FOR SPACES

William W. Bassett, Wheaton, Ill.; Robert M. Russ, Los Altos Hills, and Thomas L. Webster, Piedmont, both of Calif., assignors to Gas Research Institute, Chicago, Ill.

Filed Jan. 26, 1995, Ser. No. 378,517
Int. Cl.[6] F24F *7/00*
U.S. Cl. 236—49.3 **16 Claims**



1. A method for controlling the circulation of heat transfer fluid for thermal conditioning systems for at least partially thermally separate spaces, in which the thermal conditioning system includes a source of thermal conditioning, and a means for circulating heat transfer fluid from the source of thermal conditioning to the at least partially thermally separate spaces, such that heat may be transferred between the source of thermal conditioning and the heat transfer fluid, and between the heat transfer fluid and the at least partially thermally separate spaces, the method comprising:

sensing the temperature in each of the at least partially thermally separate spaces;

determining, at predetermined intervals of time, a calculated sensed temperature, based upon the temperatures sensed by the sensors;

comparing the calculated sensed temperature against a predetermined range of temperatures; and,

if the calculated sensed temperature is within the predetermined range, the following steps of

determining the differentials between the sensed temperatures,

comparing the determined temperature differential of the greatest absolute value against a predetermined temperature differential absolute value, and

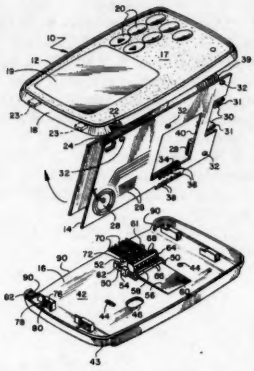
increasing the flow of the heat transfer fluid if the greatest determined temperature differential value exceeds the predetermined temperature differential value.

5,485,954

REDUCED PROFILE THERMOSTAT

Stephen E. Guy, Longview, Tex.; Louis E. Sulfstede, Ft. Wayne, Ind., and Eric Hillmer, Toronto, Canada, assignors to American Standard Inc., Piscataway, N.J.

Filed Jun. 10, 1994, Ser. No. 258,000
Int. Cl.[6] F24F *3/14;* **H01H** *37/04*
U.S. Cl. 236—78 R **15 Claims**



1. A thermostat having a reduced profile designed to control the temperature in an area and having selected components for sensing the temperature and for communicating between an operator and a HVAC system, comprising:

a subbase having a back surface designed to be mounted conformally on a surface and an opposed inner surface having a portion of the selected components or effecting control mounted thereon, such components portion including a first electrical connection, and a first mechanical connection operably coupled thereto;

a cover having a front face designed to carry selected components for communication with the operator and an opposed inner surface having a portion of the selected components for effecting control supported thereby, said portion of the selected components for effecting control including a second electrical connection, and the inner surface having a second mechanical connection operably coupled thereto,

wherein the cover is brought into registry with the subbase to form a thermostat housing having a reduced profile that substantially encloses the sensing and communicating components of the thermostat, the first electrical connection being mated with the second electrical connection and the first mechanical connection being mated to the second mechanical connection by motion of the cover with respect to the subbase that is substantially conformal with the back surface of the subbase as the cover is brought into registry with the subbase;

wherein the first electrical connection and the second electrical connection comprise an oppositely directed receiver connector and a bayonet connector respectively, the receiver connector receiving the bayonet connector therein and making electrical connection therewith and the bayonet connector being received within the receiver connector means in compressive sliding engagement therewith;

wherein the receiver connector and the bayonet connector comprise a plurality of individual receiver connectors and a corresponding number of individual bayonet connectors; and

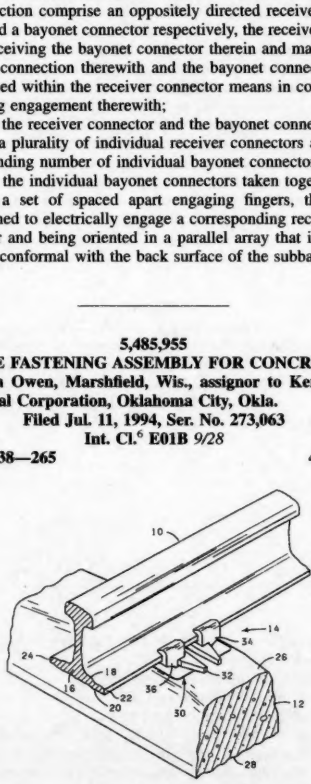
wherein the individual bayonet connectors taken together comprise a set of spaced apart engaging fingers, the fingers designed to electrically engage a corresponding receiver connector and being oriented in a parallel array that is substantially conformal with the back surface of the subbase.

5,485,955

RAIL-TIE FASTENING ASSEMBLY FOR CONCRETE TIE

S. Hudson Owen, Marshfield, Wis., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Jul. 11, 1994, Ser. No. 273,063
Int. Cl.[6] E01B *9/28*
U.S. Cl. 238—265 **47 Claims**



1. A railway track support and fastening arrangement having a rail, a rail-tie fastening assembly, and a support structure wherein the rail-tie fastening assembly is adapted for cooperating to fasten a rail to a support structure, the rail having a rail flange with an upper surface, a lower surface, a first side and a second side, the rail-tie fastening assembly comprising:

a rail seat having a plate portion and a spade portion, the plate portion adapted to receive the lower portion of the rail flange, the spade portion of the rail seat having a bottom end, the spade portion extending downwardly from the plate portion and at least a portion of the spade portion disposed in the support structure and bonded to the support structure with an elastomeric material such that the spade portion of the rail seat is spaced apart from the support structure, the elastomeric material provided with a void near the bottom end of the spade portion to permit the rail seat to move vertically downward relative to the support structure when a load is applied to the rail seat.

5,485,956

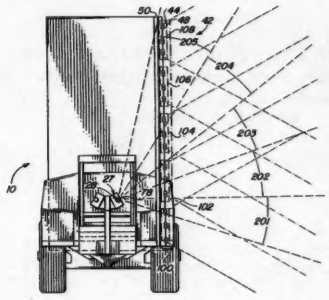
AGRICULTURAL SPRAYER

Theodore F. Lenhardt, Winter Garden, Fla., assignor to Ag-Spray, Immokalee, Fla.

Continuation of Ser. No. 605,083, Oct. 26, 1990, Pat. No. 5,172,861. This application Dec. 21, 1992, Ser. No. 994,557

Int. Cl.[6] B05B *15/00*

U.S. Cl. 239—1 **4 Claims**



4. A method for detecting foliage to be sprayed and regulating the spraying of foliage, comprising the steps of:

providing a sprayer and a single sensor carried by the sprayer;

sensing with the single sensor a presence of foliage in a first foliage zone and a presence of foliage in a second foliage zone; and

providing outputs from the sensor representing the sensing of foliage in the first and second zones for controlling spraying into those zones.

5,485,957

FUEL INJECTOR WITH AN INTERNAL PUMP

Oded E. Sturman, 3973 Santa Monica Ct., Newbury Park, Calif. 91320

Filed Aug. 5, 1994, Ser. No. 286,641

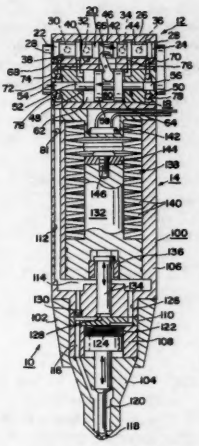
Int. Cl.[6] F02M *57/02*

U.S. Cl. 239—88 **16 Claims**

1. A fuel injector, comprising:

a housing which has a fuel port that receives a fuel, a nozzle opening that ejects fuel and a return port that allows fuel to flow out of said housing;

an intensifier that moves between a first position and a second position to increase a pressure of the fuel that is ejected from said housing;



a control valve that controls fuel flow between said intensifier and said return port;

a pressure device that supplies fuel that moves said intensifier to the first position; and,

a spring that moves said intensifier to the second position and pressurizes the fuel when said control valve allows fuel to flow m out of said return port.

5,485,958

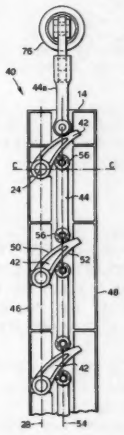
MECHANISM FOR OPERATING A CASCADE OF VARIABLE PITCH VANES

Douglas J. Nightingale, Jonesboro, Ga., assignor to Rolls-Royce, Incorporated, Reston, Va.

Filed Jun. 6, 1994, Ser. No. 254,703

Int. Cl.[6] B64C *15/00*

U.S. Cl. 239—265.19 **19 Claims**



1. A mechanism for operating a cascade of variable pitch vanes comprising:

a plurality of adjacent vanes, each one pivotally mounted about a spanwise axis of rotation spaced apart from the spanwise axis of its neighbor,

a plurality of cam means, each one fixed in relation to a respective one of the vanes,

a plurality of pushrods mounted for axial movement along a pushrod axis, the pushrods being interspaced between the cam means for effecting coordinated pivotal movement of the vanes and urged into end to end abutment with the cam means so that the spacing between neighboring pushrod ends is determined by thickness of the intervening cam means in a plane of intersection of the pushrod axis, the plane of intersection being spaced apart from the spanwise axes of the vanes so that the spacing between neighbouring pushrods alters in accordance with the angular movement of the intervening cam means, and

actuator means for moving the pushrods, whereby for a given actuating input there is a cumulative effect between successive pushrods so that along the cascade the vanes are turned through .progressively greater or lesser angles.

5,485,959

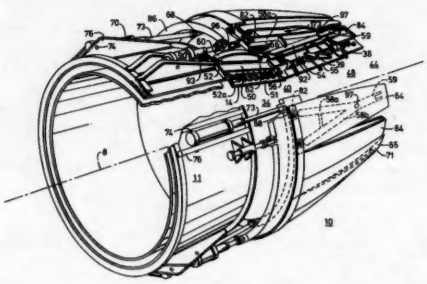
AXISYMMETRIC VECTORING EXHAUST NOZZLE THERMAL SHIELD

Jonathan M. Wood; Thomas A. Hauer, both of West Chester, and William C. Lippmeier, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 700,979, May 16, 1991, abandoned. This application Jun. 7, 1993, Ser. No. 72,678

Int. Cl.[6] B64C *15/06*

U.S. Cl. 239—265.41 **20 Claims**



1. An outer flap and seal assembly for an axisymmetric convergent/divergent nozzle, said outer flap and seal assembly comprising:

a plurality of overlapping outer flaps and outer seals having a general disposition about a longitudinal axis and a means for changing said outer flap and seal disposition from axisymmetrical to asymmetrical.

5,485,960

UNIVERSAL PAINT SPRAYER EXTENDER

Kevin J. Troudt, 6635 Devonshire Dr., Gladstone, Oreg. 97027

Filed Jul. 18, 1994, Ser. No. 277,216

Int. Cl.[6] B05B *15/06*

U.S. Cl. 239—532 **20 Claims**

1. A spray gun extender for extending the reach of a paint spray gun comprising

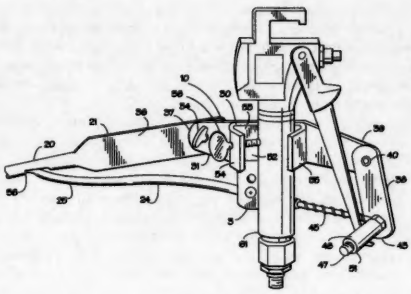
an elongate pole,

a spray gun mounting assembly pivotably mounted on a pole first end, the assembly including

a vertical support plate,

means for pivotably mounting the vertical support plate to the pole with positive and negative pitch angle adjustment,

a grip member spaced on a support plate first side distance from the pivotably mounting means such that the grip member and supporting plate are adjustable in positive and negative pitch without the grip impacting on the pole,



means for removably mounting a spray gun handle in the grip member,

spray gun trigger engaging means extending away from the support plate first side for pulling the spray gun trigger removably mounted thereon,

an actuating member on a pole second end for controlling the spray gun,

a cable running between the actuating member and the spray gun mounting assembly for pulling the trigger engaging means when the cable is pulled by the actuating member.

5,485,961

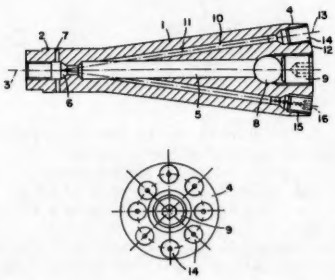
NOZZLE HEAD FOR A JET CLEANING DEVICE

Klaus Reitzig, Issum, Germany, assignor to WOMA Apparatebau GmbH, Duisburg, Germany

Filed Sep. 8, 1994, Ser. No. 303,194

Int. Cl.[6] B05B *3/02; 1/14*

U.S. Cl. 239—558 **11 Claims**



7. A nozzle head comprising

a body;

a central bore disposed in said body on a central axis thereof for receiving a pressurized flow of fluid;

a plurality of supply bores communicating with said central bore to receive pressurized fluid therefrom, said supply bores being circumferentially disposed about said central bore;

a plurality of nozzles mounted in a front face of said body circumferentially of said central axis, each said nozzle communicating with a respective supply bore to receive pressurized fluid therefrom and having a bore for expelling a jet of fluid therefrom, at least one bore of a respective nozzle being radially spaced from said central axis a distance different from others of said nozzle bores and each nozzle bore being coaxial of a respective supply bore.

5,485,962

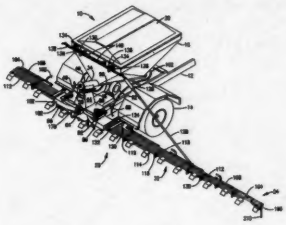
PNEUMATIC APPLICATOR FOR AGRICULTURAL PARTICULATES

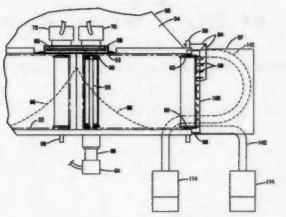
Robert W. Moss, Salina, Kans., assignor to Moss Sales & Service, Salina, Kans.

Continuation-in-part of Ser. No. 986,426, Dec. 4, 1992, abandoned. This application Aug. 4, 1994, Ser. No. 285,995

Int. Cl.[6] A01C *15/04*

U.S. Cl. 239—655 **14 Claims**





1. In a device for distributing particulate material, of the type having a hopper to store the material, means for feeding the material from the hopper, an air blower for outputting air along a longitudinal path and means for distributing the material along a lateral path, the improvement comprising:

chamber means for conveying air from the blower to the distribution means and for gradually and aerodynamically redirecting air from the longitudinal path of the blower to the lateral path of the distribution means, said chamber means including a forward section, having a first end located proximate the blower, and a transition chamber attached to an opposite end of said forward section, said transition chamber communicating with end sections attached to the distribution means.

5,485,963

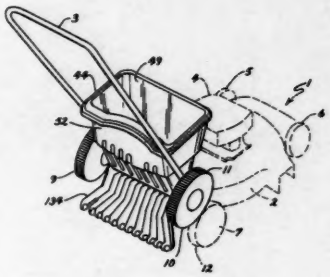
GRANULAR FERTILIZER SPREADER

Joseph J. Walto, Carver; Nathan J. Friberg, Bloomington, and Floyd D. Niskanen, Golden Valley, all of Minn., assignors to The Toro Company, Bloomington, Minn.

Filed May 11, 1994, Ser. No. 241,261

Int. Cl.[6] A01C *15/00*

U.S. Cl. 239—663 **11 Claims**



1. A granular material spreading apparatus, comprising:

(a) a discharge chute, the discharge chute having a first edge, a second edge and a bottom surface, the second edge being adapted to distribute the granular material onto an area of ground with substantially uniform density per unit of ground area that is traversed by the discharge chute;

(b) a hopper, the hopper having a first opening and a plurality of hopper discharge openings, the first hopper discharge opening being adapted to receive the granular material, the hopper discharge openings being adapted to deposit the granular material adjacent to the first edge of the discharge chute;

(c) a series of diverging open channels, the diverging open channels having a first width in a region near the first edge of the discharge chute, the diverging open channels having a second width in a region abutting the second edge of the discharge chute, the first width being less than the second width; and

(d) a plurality of chute discharge openings formed in the bottom surface of the discharge chute such that one chute discharge opening is formed in the bottom surface of the discharge chute underlying each diverging open channel, each chute discharge opening being located along the second edge of the discharge chute and having a width that is more than half the second width of the diverging open channel in which the discharge opening is formed.

11. A method of distributing granular fertilizer while operating a walk behind lawn mower, comprising the steps of:

(a) mounting a hopper behind the lawn mower such that a first pair of drive wheels rotatably affixed to an impeller within the hopper frictionally engages a second pair of rear mower wheels;

(b) resiliently urging the first pair of drive wheels into frictional engagement with the second pair of rear mower wheels; and

(c) mounting at least one adjustable clamp onto a component of the lawn mower such that slidable adjustment of the clamp varies the frictional engagement between the first pair of drive wheels and the second pair of rear mower wheels.

5,485,964

METHOD AND APPARATUS FOR SORTING PLASTIC ITEMS

Hubert J. Booth; Paul H. Steagall, III, and Michael W. Wright, all of Florence, S.C., assignors to Wellman, Inc., Johnsonville, S.C.

Division of Ser. No. 850,850, Mar. 13, 1992, Pat. No. 5,344,026, which is a continuation-in-part of Ser. No. 669,043, Mar. 14, 1992, abandoned. This application Sep. 1, 1994, Ser. No. 299,846

Int. Cl.[6] B02C *13/20;19/00;25/00*

U.S. Cl. 241—27 **17 Claims**

1. An apparatus for disengaging interlocked bottle clusters into single bottles comprising:

(a) a housing;

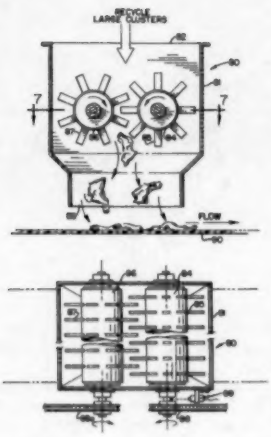
(b) a first movable support for fingers attached within said housing;

(c) a first plurality of fingers each having a base end and a striking end, with said base end attached to said first movable support and said striking end extending away from said support;

(d) a second movable support for fingers attached within said housing;

(e) a second plurality of fingers each having a base end and a striking end, said base end attached to said first movable support, said striking end extending away from said support; and

(f) means for moving said first and second movable supports, said moving means being configured so that said first movable support moves at an angular velocity of at least about three times the angular velocity of said second movable support;



wherein said first movable support and said second movable support are positioned relative to each other so that as said first movable support moves said first plurality of fingers, and as said second movable support moves said second plurality of fingers, said striking ends of said first plurality of fingers intermesh but do not contact said striking ends of said second plurality of fingers.

5,485,965

AUTOMATIC PRODUCT FEED AND METHOD FOR CONTROLLING A MILLING ROLLER MILL

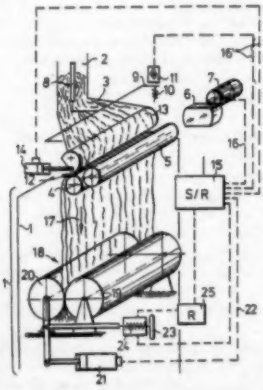
Rene Hostettler, Sirnach, and Ernst Maechler, Uzwil, both of, Switzerland, assignors to Buehler AG, Switzerland

Continuation of Ser. No. 910,187, Aug. 13, 1992, Pat. No. 5,361,995. This application Nov. 4, 1994, Ser. No. 335,980

Claims priority, application Switzerland, Dec. 12, 1990, 3931/90

Int. Cl.[6] **B02C** *25/00*

U.S. Cl. 241—29 **22 Claims**



1. A method for controlling the grinding in a multiple roll milling roller mill, the mill having two pairs of grinding rollers arranged one above the other, a sensor for sensing product feed, a product feed device for regulating product feed to the grinding rollers, and means for engaging and disengaging each pair of grinding rollers, the method comprising the steps of:

generating an analog signal using the sensor, the analog signal being proportional to the product flow in the mill;

regulating the product feed using the analog signal;

generating an independently adjustable digital signal using the sensor; and

controlling the means for engaging and disengaging the pairs of grinding rollers using the digital signal.

5,485,966

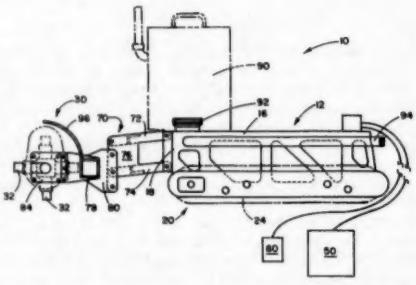
REMOTELY CONTROLLED CHOPPING MACHINE FOR TANK CLEANING

Robert R. Cradeur, Sulphur, La., assignor to Serv-Tech, Inc., Houston, Tex.

Filed May 3, 1994, Ser. No. 237,455

Int. Cl.[6] **B02C** *13/02;25/00*

U.S. Cl. 241—39 **15 Claims**



1. An apparatus useful for chopping waste on the interior bottom of a storage tank having an entryway adjacent said bottom, comprising:

a frame;

a traction drive means for moving said apparatus, said traction drive means being detachably mounted on said frame;

a support assembly detachably mounted to a forward end of said frame and having a pair of upper and lower arms detachably connected to said frame at a first end of said arms, a plate member fixedly connected to a second end of said arms, and a pair of spaced apart flange mounting plates each fixedly attached to said plate member;

a chopping assembly rotatably mounted in a pair of bearing assemblies, said bearing assemblies being detachably connectable to a respective one of said flange mounting plates of the support assembly, and said chopping assembly being separately insertable through said entryway;

a hydraulic power means for independently powering said traction drive means and said chopping assembly; and,

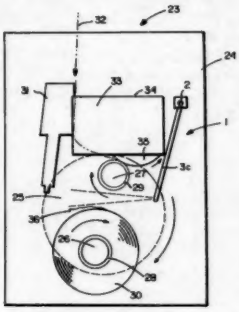
a hydraulic power means for regulating the operation of said hydraulic power means.

5,485,967

YARN WINDING APPARATUS WITH MANIFOLD ASSEMBLY MOVABLE BETWEEN BLOWING AND STANDBY POSITIONS RELATIVE TO A PAIR OF BOBBIN CARRYING SPINDLES

Billy E. Ray, Liberty; Gregg T. Cox, Central; Fred D. Bryant, Six Mile; Jimmie A. Ray, Pickens; B. Joe Christopher, Easley, and Dan C. Holcombe, Norris, all of S.C., assignors to BASF Corporation, Mt. Olive, N.J.

Filed Feb. 3, 1994, Ser. No. 191,570
Int. Cl.[6] B65H *54/00*
U.S. Cl. 242—18 A **11 Claims**



1. A yarn winding apparatus comprising:

a turret which carries at least one pair of parallel spindles for holding bobbins on which yarn is wound, said turret being rotatable so as to present one of the spindles to a yarn-winding position wherein yarn is wound about the bobbin thereon to form a yarn package, and the other of the spindles to a doffing position wherein a full yarn package with a free yarn end wound around the bobbin may be removed from the spindle; and

a manifold assembly for directing a stream of air between said pair of spindles to prevent entanglement of the free yarn end wound around the bobbin carried by the other of the spindles when in said doffing position from becoming entangled with the yarn being would about the bobbin carried by the one spindle when in said yarn-winding position, said manifold assembly including;

(a) an elongate tubular manifold element positioned parallel to said pair of spindles and having at least one jet which directs a curtain of air between said pair of spindles when said one spindle is in said yarn-winding position and said other spindle is in said doffing position;

(b) a manifold drive for swinging said elongate tubular manifold between blowing and stand-by positions wherein said elongate tubular member is disposed closer and farther from said spindles, respectively, wherein said at least one jet directs the curtain of air between said spindles when said elongate tubular manifold element is in said blowing position; and

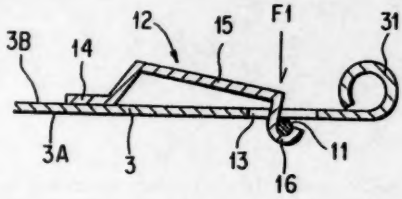
(c) a tubular riser having one end fluid-connected to said tubular manifold and an opposite end operatively connected to said manifold drive, wherein said manifold drive pivots said tubular riser which in turn swings said elongate tubular manifold between said blowing and stand-by positions.

5,485,968

TAKE-UP REEL FOR METALLIC FILAMENT

Kaoru Fujioka, Tochigi, Japan, assignor to Bridgestone Metalpha Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1993, Ser. No. 125,376
Claims priority, application Japan, Sep. 28, 1992, 4-282388
Int. Cl.[6] B65H *75/28;51/015*
U.S. Cl. 242—125.2 **8 Claims**



1. A filament take-up reel having a winding drum for accepting a winding of a filament thereon, said take-up reel comprising:

said winding drum having first and second axial ends;

first and second flanges having substantially circular perimeters disposed respectively at said first and second axial ends of the winding drum and having a diameter greater than a diameter of said drum to hold said filament therebetween, said first and second flanges each having facing inner surfaces and outer surfaces;

retaining means for retaining said filament disposed on at least said first flange;

said retaining means including a catcher having base portion at a first end of said catcher fixed to the outer surface of said first flange, a hook portion at a second end of said catcher, an intermediate portion connecting said base and hook portions, and said first flange defining an access hole having a size large enough to accept said hook portion for passage therethrough from a first position outside of said access hole to a second position beyond a plane of said access hole and between said first and second flanges

said hook portion being configured to accept and hold said filament between said hook portion and said inner surface of said first flange;

said intermediate portion extending from said base portion at a trajectory displacing said intermediate portion outwardly from said outer surface of said first flange and toward said access hole in said first flange to position said hook portion in functional alignment with said access hole; and

said catcher having a resilience sufficient to permit elastic deflection of said intermediate portion to displace said hook portion from said first position to said second position when a force is applied thereto, thereby allowing said hook portion to return toward said first position upon removal of said force for clamping said filament between said hook portion and said inner surface of said first flange.

5,485,969

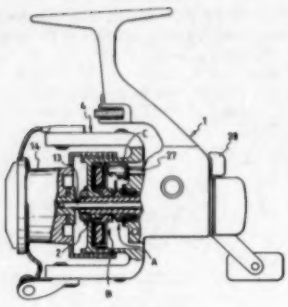
REVERSE ROTATION PREVENTIVE MECHANISM FOR FISHING REEL

Nobuyuki Yamaguchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Aug. 31, 1993, Ser. No. 114,337
Claims priority, application Japan, Sep. 1, 1992, 4-067063 U
Int. Cl.[6] A01K *89/01;* **F16D** *55/02*
U.S. Cl. 242—247 **11 Claims**

1. A reverse rotation preventive mechanism for a fishing reel having a body and a rotary member rotatably supported on said body, said mechanism comprising:

first preventive means for permitting said rotary member to rotate in a first direction relative to said body and preventing said rotary member from rotating relative thereto in a second



direction opposite to said first direction when rotational torque exerted on said rotary member in said second direction is below a predetermined value, said first preventive means including a roller-type one-way clutch having an inner race member, and outer race member, and a plurality of roller members interposed between said inner and outer race members, wherein at least one of said inner race member, outer race member, and roller members is formed of synthetic resin whereby said rotary member rotates in said second direction against a frictional resistance of said first preventive member when said rotational torque exceeds said predetermined value; and

a second preventive means for permitting said rotary member to rotate in said first direction relative to said body and preventing said rotary member from rotating in said second direction relative thereto when said rotational torque exceeds said predetermined value.

5,485,970

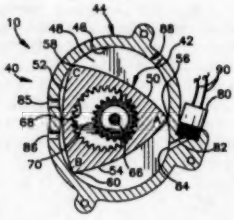
SEAT BELT PRETENSIONER

Charles E. Steffens, Jr., Washington, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Mar. 21, 1994, Ser. No. 210,931

Int. Cl.[6] B60R *22/46*

U.S. Cl. 242—374 **19 Claims**



1. An apparatus for tensioning belt webbing to restrain movement of a vehicle occupant, said apparatus comprising:

a rotary trochoidal motor comprising a housing having a wall with an inner surface defining a chamber, a rotor rotatable and orbitable in said chamber about an axis and having a fluid engagement surface, an output shaft supported for rotation relative to said housing, and means for transmitting rotational force from said rotor to said output shaft to rotate said output shaft;

a fluid source actuatable to supply fluid under pressure;

means for metering and directing fluid under pressure from said fluid source when actuated into said chamber and against said fluid engagement surface of said rotor to rotate said rotor in a first direction of rotation in said chamber and thereby to rotate said output shaft;

a belt webbing engagement member engageable with the belt webbing to tension the belt webbing; and

means for interconnecting said output shaft with said belt webbing engagement member to transmit force from said rotating output shaft to said belt webbing engagement member to tension the belt webbing.

5,485,971

SEAT BELT RETRACTOR

Hidekazu Nakaya, Osaka, and Toshihiro Amatsu, Suita, both of, Japan, assignors to Ashimori Kogyo Kabushiki Kaisha, Osaka, Japan

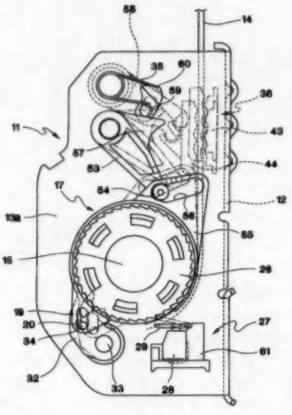
PCT No. PCT/JP93/01260, § 371 Date Apr. 21, 1994, § 102(e) Date Apr. 21, 1994, PCT Pub. No. WO94/05528, PCT Pub. Date Mar. 17, 1994

PCT Filed Sep. 7, 1993, Ser. No. 211,969

Claims priority, application Japan, Sep. 7, 1992, 4-69077 U

Int. Cl.[6] B60R *22/405;22/42*

U.S. Cl. 242—381.1 **7 Claims**



4. A seat belt retractor for mounting on a vehicle body, comprising:

a frame;

a webbing reel shaft rotatably mounted on the frame;

a lock plate rotatably mounted on the webbing reel shaft;

inertial detecting means for detecting acceleration of the vehicle body, abnormal inclination of the vehicle body and/or rapid rotation of the webbing reel shaft in the webbing withdrawal direction and linking the lock plate to the webbing reel shaft;

locking means for locking the rotation of the webbing reel shaft when actuated by a rotation of the lock plate accompanying a rotation of the webbing reel shaft when the lock plate and the webbing reel shaft are linked together, the locking means comprising a ratchet wheel which rotates integrally with the webbing reel shaft and a pawl pivotally mounted on the frame and urged away from the ratchet wheel which pawl engages with the ratchet wheel guided by a guide hole formed in the lock plate;

a clamp device mounted for clamping the webbing withdrawn from the webbing reel shaft and a clamp actuator arm for actuating the clamp device by moving in cooperation with the rotation of the lock plate, the clamp device comprising first and second clamp members disposed facing each other with the webbing between them and a clamp case for holding the first clamp member in such a way that it can move toward and away from the second clamp member and holding both of the clamp members in such a way that they can simultaneously move in the length direction of the webbing, which clamp actuator arm is pivotally mounted on the frame and has its end portion fitted in a channel in the first clamp member and

moving in cooperation with the lock plate pivots in the webbing withdrawal direction and pushes the first clamp member toward the second clamp member;

wherein the end portion of the clamp actuator arm has a circular arcuate surface which in cross section forms part of a circle having a diameter greater than the thickness of this end portion and having its center offset toward the webbing reel shaft from a centerline of the clamp actuator arm.

5,485,972

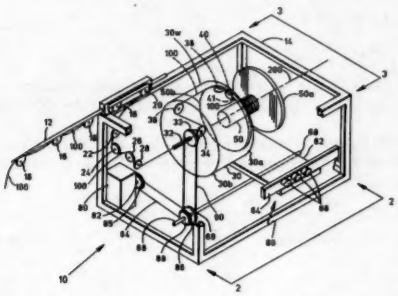
CABLE RECOVERY WINDER

Herbert L. Mummery, deceased, late of Kaneohe; Anthony H. Koyamatsu, Kaneohe, and Michael B. Young, Mililani, all of Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1993, Ser. No. 155,057

Int. Cl.[6] B65H *75/38*

U.S. Cl. 242—386 **12 Claims**



1. An apparatus for producing a wound cable pack having a uniform pitch and incorporating a twist per turn in a cable, comprising:

a drum having an axis of rotation, said dram being constrained to rotational movement around said axis of rotation;

a non-rotating spool sized to fit within said drum and having a central longitudinal axis coaxial with said drum's axis of rotation, said spool being constrained to linear movement along said axis of rotation within said drum;

a cable feeding assembly mounted to said drum for rotation therewith, said cable feeding assembly leading said cable onto said spool from a feed point such that a twist is induced in said cable as said cable feeding assembly orbits about said spool;

a drive mechanism operatively connected to said drum and said spool for rotating said drum and, in synchronism therewith, for imparting said linear movement to said spool, wherein said twist per turn is induced in said cable for each rotation of said drum, and wherein said uniform pitch is determined by the amount of said linear movement for each rotation of said drum; said drive mechanism comprising:

a linear traversing mechanism operatively connected to said spool;

a drive shaft operatively connected to said linear traversing mechanism and to said drum, wherein rotation of said drive shaft causes said rotational movement of said drum and said linear movement of said spool; and

a motor operatively connected to said drive shaft for rotating said drive shaft.

5,485,973

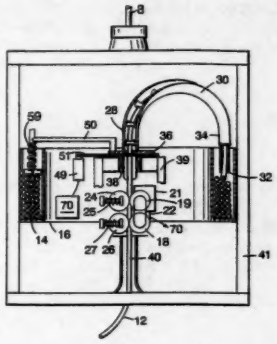
STORAGE OF CABLE

Peter Nellessen, Jr., Palm Beach Gardens, Fla., assignor to Benthos, Inc., North Falmouth, Mass.

Continuation of Ser. No. 14,422, Feb. 5, 1993, abandoned. This application Sep. 26, 1994, Ser. No. 312,500

Int. Cl.[6] B65H *75/34;* **B63G** *8/00*

U.S. Cl. 242—386 **19 Claims**



1. Apparatus for storing cable comprising

a receptacle for the cable, and

a mechanism for coiling the cable in the receptacle, the mechanism comprising

an arm mounted at an axis to receive the cable and to deliver the cable to a feed end,

a cable driver mounted to force the cable into the arm at the axis and toward the feed end causing rotation of the arm about the axis, and

a distinct arm driver mounted to assist rotation of the arm about the axis while the cable is being delivered into the arm at the axis,

the cable driver and the arm being configured to impart a twist to the cable as it passes from the axis to the free end.

5,485,974

DEVICE FOR SLITTING STRIP METAL

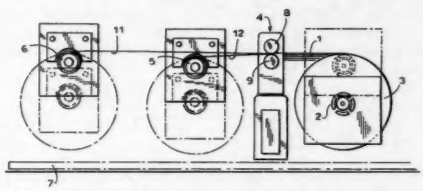
Egon Hohfeld, An der langen Hecke 20, D-58644 Iserlohn, Germany

Filed Jul. 7, 1994, Ser. No. 256,421

Claims priority, application Germany, Jan. 9, 1992, 42 00 351.2

Int. Cl.[6] B65H *35/02*

U.S. Cl. 242—525.6 **3 Claims**



1. A method of splitting a metal strip wound up in a coil on a feed spool, the method comprising the steps of:

supporting the feed spool for rotation about a horizontal axis;

passing the strip along a generally horizontal feed plane through a rotary-blade cutter and subdividing the strip at the cutter into a plurality of even substrips and a plurality of odd substrips interleaved with the even substrips;

guiding the even substrips upward in an upper plane forming an acute angle with the feed plane from the cutter to a respective

even-strip windup spool and winding the even substrips up on the even-strip windup spool;

guiding the odd substrips downward in a lower plane forming an acute angle with the feed plane from the cutter to a respective odd-strip windup spool and winding the odd substrips up on the odd-strip windup spool;

rotatably driving the cutter and the feed spool at substantially the same speed;

rotatably driving both the windup spools at a speed slightly greater than the speed of the cutter and feed spool to pull the substrips from the cutter and the strip from the feed spool; and

vertically adjusting the positions of the spools to maintain the planes in substantially the same orientation relative to one another.

5,485,975

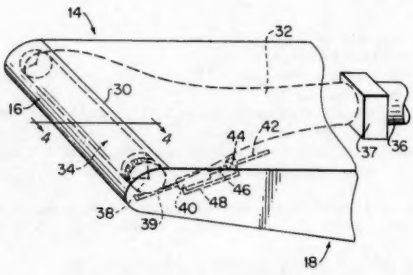
SLOTTED COWL INLET LIP FOR INTRODUCING HIGH PRESSURE AIR

Runyon H. Tindell, Old Bethpage, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jul. 19, 1994, Ser. No. 277,506

Int. Cl.[6] B64D *29/06*

U.S. Cl. 244—53 B **5 Claims**



1. An air delivery system for an air inlet conduit, the conduit having a lower lip, the system comprising:

a first transverse slot formed through an upper surface of the lower lip and positioned in parallel adjacency to a leading edge of the lip;

a second transverse slot formed through a lower surface of the lower lip and positioned in parallel adjacency to the leading edge of the lip;

vane means transversely located in the interior of the lip, between the upper and lower surfaces, and internally aligned with the first and second transverse slots;

vane members extending from the vane means for selectively blocking one or the other of the slots;

a duct located within the interior of the lower lip for delivering pressurized air to the vane means; and

means for selectively displacing the vane means for blocking one or the other of the slots.

5,485,976

PLASTIC BOTTOM DIAPHRAGM FOR AIRCRAFT SEAT

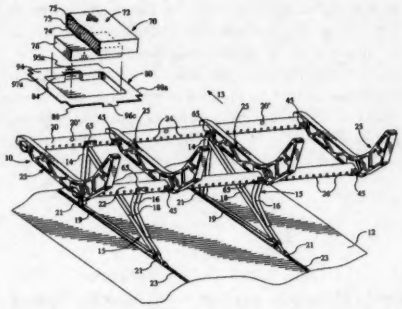
Kevin Creed, and Klay Gilbert, both of Lindsay, Tex., assignors to Weber Aircraft, Inc., Gainesville, Tex.

Filed Jan. 12, 1994, Ser. No. 180,566

Int. Cl.[6] B64D *11/06;25/00*

U.S. Cl. 244—118.6 **22 Claims**

1. A passenger seat comprising: a base frame having a pair of spaced stretcher members and a pair of spreaders; a seat cushion having an energy absorbing portion formed of buoyant material and a comfort portion, said energy absorbing portion being positioned adjacent said comfort portion; a bottom diaphragm extending between said stretcher members, said bottom diaphragm having an open receptacle for receiving said energy absorbing portion of said seat cushion and for positioning said energy absorbing portion below the spinal column of a passenger seated on said comfort portion; and rim means on said bottom diaphragm for engaging said spaced stretcher members and for supporting said comfort portion of said seat cushion.



5,485,977

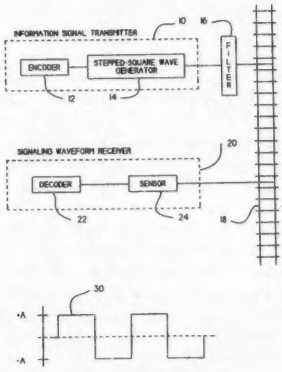
REDUCED HARMONIC SWITCHING MODE APPARATUS AND METHOD FOR RAILROAD VEHICLE SIGNALING

James P. Brown, Allison Park, and Robert P. Bozio, Pittsburgh, both of Pa., assignors to Union Switch & Signal Inc., Pittsburgh, Pa.

Filed Sep. 26, 1994, Ser. No. 312,536

Int. Cl.[6] B61L *27/00*

U.S. Cl. 246—167 R **9 Claims**



1. A signaling apparatus for transmitting information from wayside to a railway vehicle via rails of a track comprising:

a. an information signal transmitter having a stepped-square wave generator for generating a signaling waveform, said signaling waveform having a plurality of square wave signals;

b. at least a portion of a first preselected duty cycle of at least one of said plurality of square wave signals overlaps at least a portion of a second preselected duty cycle of at-least one other of said plurality of square wave signals so that said signaling waveform is generally a stepped-square waveform, said signaling waveform having information encoded thereupon;

c. said transmitter being a switching-mode transmitter and transmitting said signaling waveform onto such rails; and

d. said stepped-square wave generator further including

(1) a multi-tap transformer having a plurality of transformer inputs and at least one transformer output,

(2) a plurality of semiconductor switches connected to selected ones of said plurality of transformer inputs, said semiconductor switches for selectively impressing a predetermined output voltage across said at least one transformer output,

(3) a switching controller electrically connected to selected ones of said plurality of semiconductor switches, said switching controller for producing a plurality of drive signals for selected ones of said plurality of semiconductor switches, and

(4) an encoder electrically connected to said switching controller, for encoding said information signal onto said signaling waveform.

5,485,978

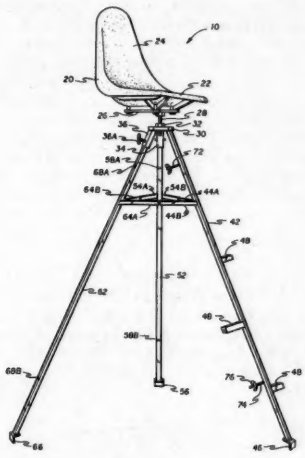
HUNTER'S TRIPOD STAND

Harvey Hernandez, 4646 Wales, Corpus Christi, Tex. 78413

Filed Apr. 26, 1994, Ser. No. 233,853

Int. Cl.[6] F16M *11/24*

U.S. Cl. 248—165 **18 Claims**



1. An elevated stand configured for storage or transport comprising:

a rotatable body supporting member;

a support base connected to said rotatable body supporting member, said support base including a base platform and a plurality of legs comprising a first leg and a second leg;

said first leg there to includes at least one storage rod for securing said second leg, a plurality of rungs spaced along a portion of said first leg and a foot rest segment located above said rungs, and said second leg being a detachable leg and further including a foot rest segment, whereby said second leg can be attached to said first leg in a storage or transport configuration.

5,485,979

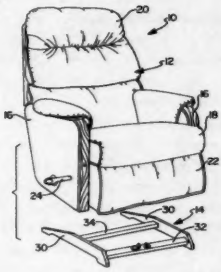
CHAIR BASE

Larry P. LaPointe, Temperance; Jonathan R. Saul, LaSalle, and Karl J. Komorowski, Petersburg, all of Mich., assignors to La-Z-Boy Chair Company, Monroe, Mich.

Filed Jan. 12, 1994, Ser. No. 180,889

Int. Cl.[6] F16M *11/24*

U.S. Cl. 248—188.2 **22 Claims**



1. In a motion chair having an upholstered chair frame supported for movement on a base assembly, said base assembly comprising:

a pair of laterally-spaced side rails each having a sidewall portion with a front and rear slot formed in said sidewall portion and each of said side rail being of a one piece construction;

a front cross rail having an end portion at each end thereof and a transverse flange portion including first tab means extending outwardly beyond said end portions, Said first tab means adapted for receipt within said front slots of said laterally-spaced side rails;

a rear cross rail having an end portion at each end thereof and a transverse flange portion including second tab means extending outwardly beyond said end portions, said second tab means adapted for receipt within said rear slots of said laterally-spaced side rails;

said front and rear cross rails each being of a one piece construction and being disposed between said laterally-spaced side rails such that said end portions abut said sidewall portions; and

locking means for lockingly retaining each of said first and second tab means within their respective front and rear slots.

5,485,980

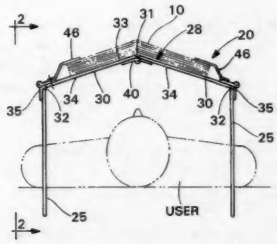
INVERTED BOOK STAND

Paul Luccia, 427 W. County Line Rd., Huntingdon Valley, Pa. 19006

Filed Nov. 28, 1994, Ser. No. 345,313

Int. Cl.[6] A47B *23/00*

U.S. Cl. 248—445 **10 Claims**



1. An inverted book stand comprised of

a book support platform having two transparent panels, each having an inner edge, an outer edge, a book support surface and a bottom surface, the panels are pivotally connected along the inner edges and can be moved from a first, stowed/transport position, where the panels are folded together and in close proximity to each other, to a second, in use position, where the panels are opened to form an angle of less than 180°;

integral limiting means at the pivotal connection between the panels to maintain the angle between panels when they are in the open position;

support members pivotally connected to the outer edge of each panel which can be moved from a first, stowed position, wherein each support member is in a closed position parallel and adjacent to the respective panel surface, and a second, in use position, where the support member is pivoted to an angle of more than 90° from the panel surface; and

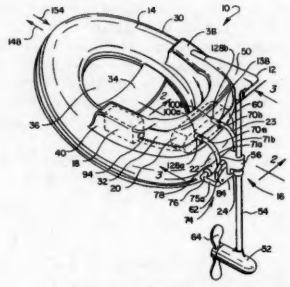
integral limiting means at the pivotal connection between each support member and the panels to limit the angle formed between them when the support members are opened whereby the book stand can be folded to a flat, compact size by folding the panels and the support members to the stowed positions.

5,485,981

MOTOR MOUNT ASSEMBLY FOR FLOAT TUBE

Gregory J. Lindahl, 1614 Montana Ave., Gladstone, Mich. 49837

Filed Aug. 2, 1994, Ser. No. 285,337
Int. Cl.[6] F16M *1/00*
U.S. Cl. 248—641 **19 Claims**



1. A motor mount assembly for supporting an outboard motor of a variety having a mounting clamp and given operational thrust upon a float tube having a backrest portion with a pocket cavity of given widthwise dimension and a closing flap, and a tube portion, comprising:

a thrust transfer member dimensioned in correspondence with said pocket cavity for insertion and retention therein having two spaced apart receiving channels with openings facing horizontally outwardly from said pocket cavity when said thrust transfer member is operatively positioned within said pocket cavity;

first and second suspension members each having a coupling portion slidably insertable within one of said receiving channels, and a thrust transfer portion depending downwardly therefrom; and

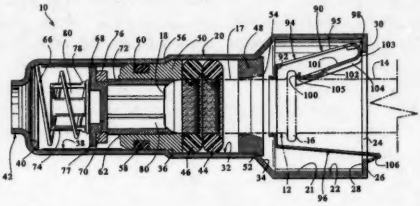
a motor mounting block coupled with said first and second suspension members at said thrust transfer portion thereof, and having an upwardly disposed clamp receiving portion for receiving said mounting clamp.

5,485,982

QUICK CONNECTOR WITH TUBE ACTIVATED CHECK VALVE

Stephen H. Gunderson, Marine City, Mich., assignor to Bundy Corporation, Warren, Mich.

Filed Sep. 16, 1994, Ser. No. 307,378
Int. Cl.[6] F16L *37/00*
U.S. Cl. 251—149.6 **19 Claims**



1. A quick connector coupling for forming a joint in a fluid line system comprising:

a female connector body defining a bore, said bore extending axially inwardly into said connector body from an entrance, a radial rim being defined in said connector body adjacent said entrance, said radial rim defining an interior abutment surface;

a male member received within said bore of said connector body and having an enlarged upset portion;

a retainer disposed within said bore of said connector body and including retention legs having members which extend between said upset portion of said male member and said interior abutment surface to retain said male member within said bore; and

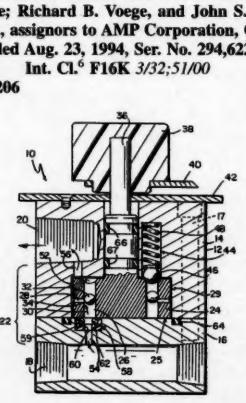
a check valve disposed within said bore of said connector body, said check valve including a guidance sleeve fit within said bore and having a valve seat, and a plunger movable within said guidance sleeve and having a solid central portion, a hollow outer cylindrical portion extending axially outwardly from said central portion and into said guidance sleeve, a hollow inner cylindrical portion extending axially inwardly from said central portion, and a valve seal engagable with said valve seat, said plunger being movable within said guidance sleeve from a checked position, wherein said valve seat contacts said valve seal, to an unchecked position, wherein said valve seat is separated from said valve seal.

5,485,983

SEAL APPARATUS FOR A FLOW CONTROL VALVE

James A. Voege; Richard B. Voege, and John S. Voege, all of Carmel, Ind., assignors to AMP Corporation, Carmel, Ind.

Filed Aug. 23, 1994, Ser. No. 294,622
Int. Cl.[6] F16K *3/32;51/00*
U.S. Cl. 251—206 **16 Claims**



1. In a calibrated gas metering valve including a valve body having a gas inlet and a gas outlet, and a metering element located

therebetween, the metering element including a passageway formed therethrough to permit gas flow through the passageway from the gas inlet to the gas outlet, the improvement comprising:

a cylindrical sealing disk formed to include an aperture aligned with the passageway and the gas inlet to permit gas flow through the sealing disk, the sealing disk providing a plastic seal abutting and extending between the valve body and the metering element, the sealing disk being formed to include a recessed portion surrounding the aperture; and

an O-ring located in the recessed portion of the sealing disk.

5,485,984

DIAPHRAGM VALVE

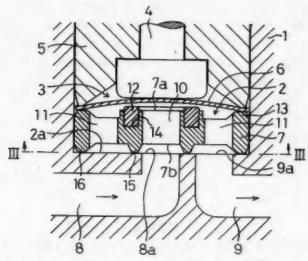
Shigeru Itoi; Michio Yamaji, and Tetsuya Kojima, all of Osaka, Japan, assignors to Masako Kiyohara, Kumamoto, Japan

Filed May 27, 1994, Ser. No. 250,609

Claims priority, application Japan, Jun. 2, 1993, 5-131939

Int. Cl.[6] F16K 7/12

U.S. Cl. 251—331 **8 Claims**



1. A diaphragm valve comprising:

a valve body having a chamber, a fluid inlet passage and a fluid outlet passage communicating with said chamber through openings in a wall of said chamber;

a diaphragm disposed in said chamber and dividing said chamber into an operating chamber and a valve chamber;

a removable elastic seating ring disposed against said wall in said valve chamber, said seating ring having a first passage extending therethrough and communicating with said fluid inlet passage and second passage means communicating with said valve chamber on opposite sides of said seating ring, said seating ring having a valve seat disposed thereon and surrounding said first passage on a first surface of said seating ring facing said diaphragm;

valve operating means for selectively moving said diaphragm into contact with said valve seat to block flow of a fluid from said fluid inlet passage to said valve chamber; and,

a diaphragm holder for pressing against a peripheral region of a first surface of said diaphragm, said seating ring having a peripheral projection on its first surface against which said diaphragm is pressed to thereby clamp said diaphragm, said seating ring having first and second annular projections on a second surface of said seating ring facing said wall, said first annular projection surrounding said first passage and said second annular projection extending along the periphery of said second surface, said first annular projection extending outwardly from the second surface of the seating ring further than said second annular projection whereby said first annular projection forms a fluid seal with said wall when said diaphragm is pressed against the peripheral projection on the first surface of the seating ring.

5,485,985

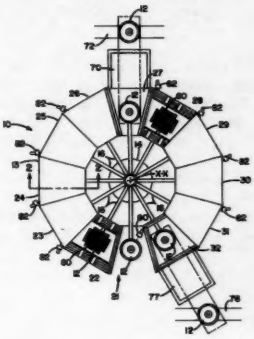
METHOD AND APPARATUS FOR HEAT TREATING

John R. Eppeland, St. James, and Jack E. Mannerud, Coon Rapids, both of Minn., assignors to BGK Finishing Systems, Inc., Blaine, Minn.

Division of Ser. No. 59,191, May 6, 1993, Pat. No. 5,306,359, which is a continuation of Ser. No. 824,378, Jan. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 788,252, Nov. 5, 1991, abandoned. This application Jan. 27, 1994, Ser. No. 187,612

Int. Cl.[6] C21D 11/00

U.S. Cl. 266—87 **30 Claims**



1. An apparatus for metallurgically heat treating a plurality of discreet, individually movable aluminum alloy parts, said apparatus comprising a plurality of successive stations for heat treating said parts, said plurality of stations arranged in a line of travel with means for one of said parts in each of said stations to be heat treated with direct radiation from at least one infrared radiation lamp until said part attains a final desired state of metallurgical heat treatment after heat treatment in said stations, means for placing and holding said part in one of said plurality of stations and heat treating said part in said one of said plurality of stations with a first infrared radiation intensity independent of an infrared radiation intensity in others of said plurality of stations, said first infrared radiation intensity selected, at least in part; in response to a measured initial temperature of said part prior to said part being heat treated in said first station and means for holding said part substantially stationary relative to said line of travel in said first station during said heat treatment for said part to be heated by said first infrared radiation intensity until a temperature of said part is elevated to a temperature greater than said initial temperature and for said part to at least partially attain said desired final state of metallurgical heat treatment, means for moving said part along said line of travel to a second one of said plurality of stations and holding said part substantially stationary relative to said line of travel in said second one of said plurality of stations with a second infrared radiation intensity independent of an infrared radiation intensity in others of said plurality of stations.

5,485,986

FURNACE WITH IN SITU FOAMED INSULATION AND PROCESS FOR ITS MANUFACTURE

Günther Schmidt, Waldbröl; Peter Randel, Langenfeld; Hans-Werner Engels, Troisdorf, and Bernd Geick, Eitorf, all of, Germany, assignors to Huls Troisdorf AG, Troisdorf, Germany

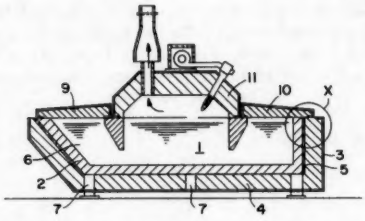
PCT No. PCT/EP92/01826, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994, PCT Pub. No. WO93/04010, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 12, 1992, Ser. No. 193,184

Claims priority, application Germany, Aug. 12, 1991, 41 26 628.5

Int. Cl.[6] C21B *7/04*

U.S. Cl. 266—280 25 Claims



1. A furnace (1) comprising an inner wall (2), an outer wall (3) and thermal insulation (4) arranged between the inner wall (2) and the outer wall (3), and wherein the thermal insulation (4) comprises an inorganic foam, said foam having been foamed up and hardened in situ from an inorganic hardenable mass, the mass containing,

per 100 parts by weight of a reactive solid stone-forming component,

40–250 parts by weight of a alkaline hardener which effects the hardening reaction of the reactive solid stone-forming component

40–250 parts by weight of fillers, and a blowing agent.

5,485,987

CYLINDER PISTON DEVICE

Klaus-Dieter Jobelius, Boppard; Helmut Morgen, Mannebach; Heinrich Spurzem, Mayen, and Stefan Völpel, Koblenz, all of, Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed Jan. 15, 1992, Ser. No. 821,190

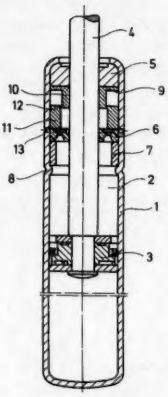
Claims priority, application Germany, Jan. 21, 1991, 41 01 567.3

Int. Cl.[6] F16F *9/02;9/34;* E05F *3/02;15/02*

U.S. Cl. 267—64.28 55 Claims

1. A cylinder piston device comprising a cylinder member having an axis, a circumferential wall and two ends and defining a cavity within said cylinder member axially between said two ends, a piston rod member axially guided through at least a first one of said two ends by piston rod guiding and sealing means, a volume of pressurized fluid within said cavity and acting onto said piston rod member and an emergency exit permitting escape of fluid from said cavity under emergency conditions, said piston rod member being telescopically movable with respect to said cylinder member against the action of said pressurized fluid, said cylinder member and said piston rod member having respective basic operational shapes, said basic operational shapes of said cylinder member and said piston rod member being substantially unchangeable in case of an opening of said emergency exit,

said emergency exit comprising fluid passage means for connecting said cavity with atmosphere and a valve member, said valve member being changeable from a closing status to an opening status in response to a predetermined value of at least one of: pressure of said fluid and temperature at a temperature-sensing location of said cylinder piston device,



said fluid passage means being closed by said valve member in said closing status thereof and permitting escape of fluid in the opening status of said valve member,

said valve member being an annular valve member located radially between said circumferential wall and said piston rod member and being subject to pressure by said pressurized fluid, said annular valve member being axially supported against pressure by said pressurized fluid by an annular support face, said annular support face supporting only one of two radially adjacent ring portions of said annular valve member, a second one of said ring portions being unsupported, said first and said second ring portions being axially shearable with respect to each other in response to said predetermined value of said pressurized fluid.

5,485,988

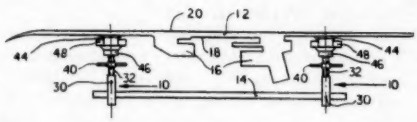
CLAMPING MEANS FOR SKI, OR THE LIKE

Leslaw Nobilec, 544 Tennyson Ave., Syracuse, N.Y. 13204

Filed May 31, 1994, Ser. No. 251,085

Int. Cl.[6] B25B *11/00*

U.S. Cl. 269—21 11 Claims



1. A device for releasably engaging a workpiece surface to hold the workpiece in a temporarily fixed position in spaced relation to rigid support means, said apparatus comprising:

a) clamp means for releasable attachment to said support means;

b) a resilient suction cup fixed with respect to said clamp means, said suction cup having a peripheral lip engageable with said workpiece surface and surrounding a concave surface having a central axis, said concave surface defining a volume variable in accordance with the degree of concavity of said concave surface;

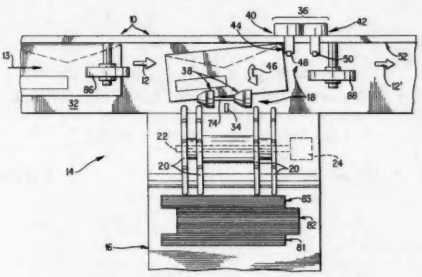
c) a member having a contact portion movable with respect to said suction cup in outwardly spaced relation to said peripheral lip in a direction substantially parallel to said central axis, whereby movement of said contact portion to urge said workpiece surface in a direction away from said suction cup increases said volume and the clamping force applied to said surface; and

d) means for selectively moving said member and contact portion into and out of engagement with said workpiece surface.

5,485,989
DIVERTER AND ON-EDGE STACKER

Steve W. McCay, Morrisville; Keith A. Harshman, Apex, both of N.C.; Stephen J. Gillette, Whitehall, and Dale A. Wentzel, Blandon, both of Pa., assignors to Bell & Howell Phillipsburg Company, Lehigh Valley, Pa.

Filed Aug. 10, 1994, Ser. No. 288,106
Int. Cl.[6] B65H *5/00*
U.S. Cl. 271—2 **20 Claims**

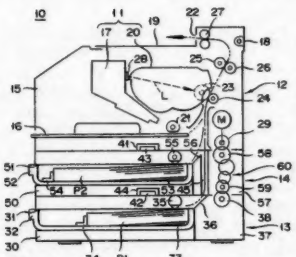


1. A diverter and on-edge stacker for envelopes, comprising:
a conveying path for envelopes;
a spider wheel having legs and therebetween gaps, said gaps defining an angular pitch therebetween;
means for sensing an envelope being transported into one of said gaps;
means for rotating said spider wheel by said angular pitch in response to sensing by said means for sensing of an envelope being transported into one of said gaps;
means for diverting conveyed envelopes selectively from said conveying path, said means for diverting including:
means for skewing a conveyed envelope, and
means for capturing and transporting the skewed envelope away from said conveying path and into one of said gaps.

5,485,990
IMAGE FORMING APPARATUS

Takeshi Kato, Toyokawa, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Nov. 8, 1994, Ser. No. 337,822
Claims priority, application Japan, Nov. 12, 1993, 5-283766
Int. Cl.[6] B41F *13/58;* **G03G** *15/00*
U.S. Cl. 271—9.08 **20 Claims**

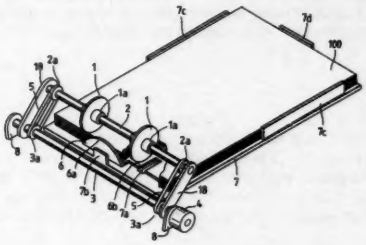


1. An image forming apparatus comprising:
a main body including an image forming system;
a manual feeding tray included in said main body to feed a recording medium manually;
a motor included in said main body;
a standard feeding unit disposed below said main body and including a feeding system to feed a recording medium accommodated therein and a gear system on an upper part of said standard feeding unit which transmits drive force generated by said motor only to said feeding system, said standard feeding unit being separably connected with said main body so as to optionally dispose an optional feeding unit between said main body and said standard feeding unit, wherein a direction of feeding a recording medium from said manual feeding tray is the same as a direction of feeding a recording medium from said standard feeding unit.

5,485,991
AUTOMATIC SHEET FEEDING APPARATUS

Hirofumi Hirano; Koh Hasegawa, both of Yokohama; Hiroyuki Inoue, Chiba; Toshihiko Bekki, Kawasaki, and Masaharu Ikado, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 932,217, Aug. 19, 1992, abandoned.
This application Oct. 28, 1994, Ser. No. 330,609
Claims priority, application Japan, Aug. 21, 1991, 3-209475; Aug. 21, 1991, 3-209482
Int. Cl.[6] B65H *3/54;* **G03G** *15/00*
U.S. Cl. 271—121 **27 Claims**



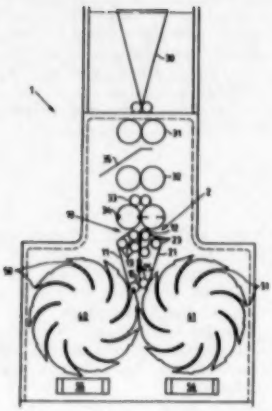
1. An automatic sheet feeding apparatus, comprising:
sheet supporting means for supporting a plurality of sheets thereon;
sheet supply means for feeding out sheets supported by said sheet supporting means; and
separation means, including a semi-circular plate member disposed downstream of said sheet supply means, for causing one of the sheets fed by said sheet supply means to flex and ride over the semi-circular plate member of said separation means, thereby to separate the sheets one by one;
wherein said sheet supply means comprises a plurality of rotary sheet supply members, and at least one of said rotary sheet supply members is elastically deformable to follow a flexure of the sheet generated when the sheet fed by said sheet supply means is riding over the semicircular plate member of said separation means.

5,485,992
FOLDER APPARATUS

Kevin F. Albert, Barrington; Louis J. Doucet, Salem, and Richard L. McKrell, Rye, all of N.H., assignors to Heidelberger Druckmaschiner AG, Heidelberg, Germany, and Heidelberg Harris, Inc., Dover, N.Y.

Filed Jul. 8, 1994, Ser. No. 273,043
Int. Cl.[6] B15H *9/14*
U.S. Cl. 271—299 **10 Claims**

1. A folder apparatus comprising:
at least two lead-in tape mechanisms arranged side-by-side to one another for delivering a signature; each lead-in tape mechanism having a left lead-in tape and a left exit roller and a corresponding right lead-in tape and a right exit roller, the right exit roller being at a different height than the left exit roller; and wherein the relative height of the right exit roller



with respect to the left exit roller of one of the at least two lead-in tape mechanism alternates with respect to an adjacent one of the at least two lead-in tape mechanisms.

5,485,993

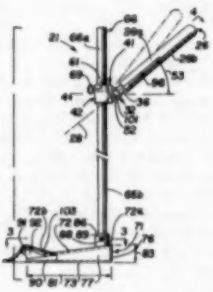
MOVABLE BASKETBALL TRAINING DEVICE

James D. Lipsett, 1248Kerwin La., Manteca, Calif. 95336

Continuation-in-part of Ser. No. 26,268, Mar. 4, 1993, abandoned, which is a continuation of Ser. No. 897,293, Jun. 11, 1992, abandoned. This application Apr. 29, 1994, Ser. No. 236,519

Int. Cl.[6] A63B *69/00*

U.S. Cl. 273—1.5 A **12 Claims**



12. A method for training a basketball player to shoot basketballs under simulated bodily contact with the aid of a basketball training device which simulates an opposing basketball player and includes weighted_base adapted to rest on said basketball floor, an upstanding member mounted to the weighted base and extending upwardly therefrom, first and second elongate padded arms having proximal and distal extremities and mounting means coupled to the proximal extremities of the padded arms for supporting the padded arms on the upstanding member in horizontally spaced apart home positions, the mounting means including first and second yieldable means coupled to the proximal extremities of the padded arms for permitting yieldable pivotal movement of the distal extremities of the padded arms from the home positions and means for positioning the proximal extremities of the padded arms forward of the weighted base, releasable means carried by the upstanding member and the mounting means for positioning the padded arms above the basketball floor at a predetermined elevation, comprising the steps of placing the training device on a basketball floor in the vicinity of an elevated basketball hoop and board so that the padded arms extend away from the hoop and board, causing the basketball player to move beneath the padded arms and to repeatedly shoot the basketball while physically engaging the padded arms and causing the basketball player to change positions between shots so as to shoot from different angles about the training device, whereby the device enables the basketball player to practice drawing a foul while shooting.

5,485,994

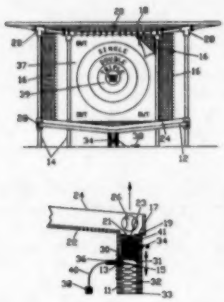
BASEBALL TOSSUP DEVICE

Alfred E. Underwood, and Dolores M. Underwood, both of 2715 Montague Dr., Galesburg, Ill. 61401

Filed Feb. 16, 1994, Ser. No. 197,307

Int. Cl.[6] A63B *69/40*

U.S. Cl. 273—26 R **2 Claims**



1. A batting practice device for tossing a ball vertically into the air, comprising:

A vertically extending tubular member having its lower end resting on a support surface and an upper end; said tubular member having an a plurality of vertically spaced apertures extending through its wall and a longitudinal slot spaced from said apertures and terminating adjacent said upper and lower ends;

a cylindrical piston positioned within said tubular member for longitudinal movement in said tubular member, said piston having a predetermined length less than the length of said tubular member for allowing longitudinal movement in said tubular member;

a coil spring positioned in said tubular member between said support surface and the lower end of said piston for biasing said piston upwards;

pedal means extending through said slot and attached to said piston for a player to manually urging said piston to a downward position against the force of said coil spring;

a spring biased latch means extending through one of said apertures for releasably latching said piston in said downward position against said bias of said spring;

an annular retaining means in said tubular member adjacent said upper end for stopping upward movement of said piston when said piston is released from said latch means;

said tubular member having an inside diameter slightly less than the diameter of a regulation baseball, whereby a baseball may be seated on said upper end of said tubular member;

said piston further having a centrally located projection on the upper end thereof, said projection defining a shoulder for abutting said annular retaining means and a central portion for contacting a ball when said piston is released from said latch means and thrust upwards by said spring; and

means remote from said ball tossing device for releasing said latch means from said piston when activated by a batter.

5,485,995

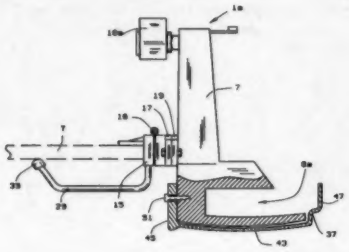
ROBOT TABLE TENNIS BALL SERVER ASSEMBLY

Joseph E. Newgarden, Jr., 400 N. Belvedere, P.O. Box 959, Gallatin, Tenn. 37066

Continuation of Ser. No. 959,276, Oct. 9, 1992, abandoned. This application Apr. 4, 1994, Ser. No. 223,306

Int. Cl.[6] A63B *69/00*

U.S. Cl. 273—30 4 Claims



1. A robot server assembly mounted to a table tennis table for collecting and serving table tennis balls to a user comprising:

a tray having a bottom wall, peripherally connected side walls, a front wall adjacent said table tennis table and a rear wall opposed to and spaced from said front wall integral to and extending upwardly from the bottom wall for containing a plurality of table tennis balls;

a table tennis ball robot server removably mounted to said front wall, said robot server having lower table tennis ball receiving means positioned within said tray and located in proximity to the bottom wall of said tray for receiving table tennis balls contained within said tray; and

mounting means for removably mounting said robot server and its attached tray to one end of a table tennis table, said mounting means being hingedly attached to and extending outwardly from a front side of said robot server, and said mounting means having support arms moveable about a hinge for positioning said mounting means in an extended position for engaging said table tennis table or a folded position adjacent said robot server to facilitate carrying and storage of said robot server assembly.

5,485,996

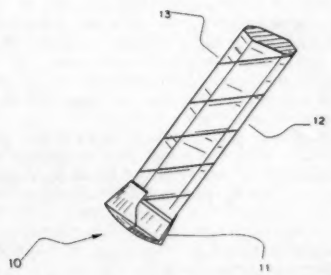
END COVER FOR THE HANDLE OF A SPORTS DEVICE

Gene Niksich, 840 McFarland Rd., Alpharetta, Ga. 30201

Filed Oct. 14, 1994, Ser. No. 323,011

Int. Cl.[6] A63B *49/00;49/08*

U.S. Cl. 273—75 1 Claim



1. A cover for the butt extremity of a handle comprising a cup-shaped monolithic structure fabricated of a silicone polymer having a Shore A hardness between 40 and 50 and an elongation to break between 100% and 250%, said cover having a downwardly convex bottom portion of circular perimeter and a sidewall portion upwardly directed from said perimeter and terminating in a circular upper extremity representing the opening of said cover, said sidewall portion contoured as an upwardly convergent conical section bounded by interior and exterior surfaces which are upwardly convergent in a manner causing the thickness of said sidewall portion to diminish progressively with distance from said bottom portion, producing at said upper extremity an extremely thin lip adapted to snugly embrace said handle without presenting a perceptible feeling of structure, said bottom portion being defined by an upper surface and a lower surface having a series of upraised annular ridges.

5,485,997

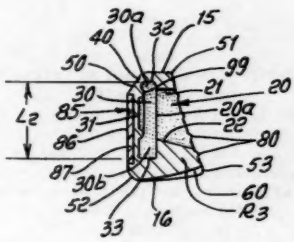
GOLF PUTTER HEAD WITH FACE PLATE INSERT HAVING HEIGHTENED MEDIAL PORTION

Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation-in-part of Ser. No. 267,885, Jul. 7, 1994, and a continuation-in-part of Ser. No. 286,275, Aug. 15, 1994, which is a continuation of Ser. No. 161,592, Dec. 6, 1993, abandoned, which is a continuation of Ser. No. 999,249, Jan. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 921,857, Aug. 5, 1992, Pat. No. 5,282,625. This application Oct. 17, 1994, Ser. No. 323,892

Int. Cl.[6] A63B *53/04*

U.S. Cl. 273—78 38 Claims



21. In a putter head, the combination comprising:

a) a longitudinally elongated putter body in the form of a bar having a rear side, top and bottom walls, a toe and a heel, and a face plate insert having a forward face for striking a golf ball,

b) a main recess sunk forwardly in said rear side, and between peripherally weighted toe and heel regional,

c) and an undercut recess extending generally parallel to said insert forward face and away from an inner extent of said main recess whereby a reduced thickness plate is formed between said recesses and said forward face and extends rearwardly of said insert,

d) said insert being non-metallic,

e) and wherein said insert has a relatively larger height medial portion and relatively lesser height opposite end portions projecting toward the heel and toward the toe.

5,485,998

GOLF CLUB HEAD

Kenji Kobayashi, Tsubame, Japan, assignor to Kabushiki Kaisha Endo Seisakusho, Japan

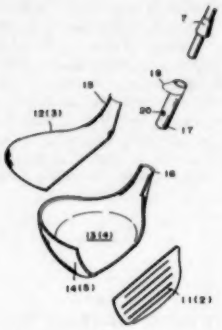
Filed Aug. 16, 1994, Ser. No. 291,188

Claims priority, application Japan, Jul. 20, 1994, 6-168400

Int. Cl.[6] A63B *53/04*

U.S. Cl. 273—80.2 3 Claims

1. A golf club head having a hollow interior defined by a face, an upper surface and a sole and side-peripheral surface, comprising;



three separate metal crusts corresponding to the face, the upper surface and the sole and side-peripheral surface respectively, which are to be forged and combined integrally so that a thickness of the face may be 1.5 to 2.5 mm, a thickness of the upper surface be 0.5 to 1.0 mm and a thickness of the sole and side-peripheral surface be 1.0 to 1.2 mm respectively, said hollow interior having a volume of 240 to 350 cc; and

a shaft mounting pipe integrally provided inside the hollow interior, connected to said neck of a golf club head, said shaft mounting pipe being provided with a mounting protrusion connected to a lower surface crust of the upper crust.

5,485,999

COMBINATION GOLF PUTTER, RETRIEVER AND EJECTION SYSTEM

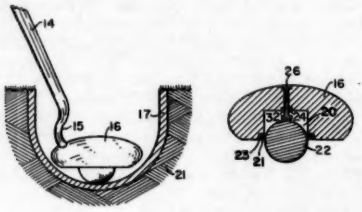
Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Pete Rasner, P.O. Box 2687, Carson City, Nev. 89702

Division of Ser. No. 948,003, Sep. 21, 1992, Pat. No. 5,269,525. This application Aug. 11, 1994, Ser. No. 288,832

The portion of the term of this patent subsequent to Dec. 14, 2010, has been disclaimed.

Int. Cl.[6] A63B *53/04*

U.S. Cl. 273—162 E **10 Claims**



1. A combination golf putter and ball retriever device comprising: a handle, a hand grip, said handle having means to attach said hand grip to one of its ends, a golf club head, means to attach said golf club head to the opposite end of said handle, said head having a golf ball striking surface, said head having a top surface and a flat bottom surface, said bottom surface having a circular recess substantially in its center section, said recess extending into the interior of said head from said bottom surface toward said top surface, said recess having peripheral upper surface and having peripheral side walls and being of a size and shape to receive a golf ball through said bottom surface, whereby said peripheral upper surface and peripheral side walls substantially confine a golf ball within said recess, a ring made of resilient material, means to capture said ring within said circular recess and said ring being of a size and shape to accept and frictionally engaged a golf ball.

5,486,000

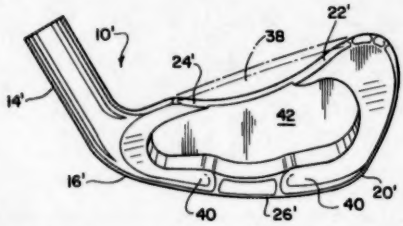
WEIGHTED GOLF IRON CLUB HEAD

Robert Chorne, 99 Russell Pl., Freeport, N.Y. 11520

Continuation-in-part of Ser. No. 886,173, May 21, 1992, Pat. No. Des. 343,216, Ser. No. 729,173, Jul. 17, 1991, Pat. No. 5,186,465, Ser. No. 643,860, Jan. 22, 1991, abandoned, and Ser. No. 469,825, Jan. 24, 1990, Pat. No. Des. 326,130, said Ser. No. 729,173is a continuation-in-part of Ser. No. 643,860, Jan. 24, 0, which is a continuation-in-part of Ser. No. 469,825, Jan. 24, 0. This application Dec. 27, 1993, Ser. No. 173,056

Int. Cl.[6] A63B *53/04*

U.S. Cl. 273—169 **6 Claims**



1. In a golf iron club head of a type having a ball-striking body of weight-imparting construction material inclined at a selected angle for driving a struck golf ball a corresponding selected height during its trajectory, said body having spaced-apart top and bottom surfaces bounding a ball-striking surface therebetween, the method of improving weight distribution comprising removing construction material from said top surface, relocating said removed construction material from said top surface to clearance positions below said top surface located adjacent opposite ends of said bottom, surface whereby said removed construction material from a location not used during ball-striking service of said golf iron, is of no adverse consequence thereto and said removed construction material in said relocated positions contributes to increasing said height attained by a struck golf ball.

5,486,001

PERSONALIZED INSTRUCTIONAL AID

Rick Baker, 10 Dundee Court, Robina Woods Queensland 4226, Australia

PCT No. PCT/AU92/00253, § 371 Date Apr. 21, 1994, § 102(e) Date Apr. 21, 1994, PCT Pub. No. WO92/21412, PCT Pub. Date Dec. 10, 1992

PCT Filed Jun. 1, 1992, Ser. No. 146,016

Claims priority, application Australia, May 30, 1991, PK6405

Int. Cl.[6] A63B *69/36*

U.S. Cl. 273—183.1 **20 Claims**

1. A method for providing an instructional aid for assisting a person to emulate a preferred movement, said method comprising:

capturing and storing initial visual image signals representative of a particular movement at a first location,

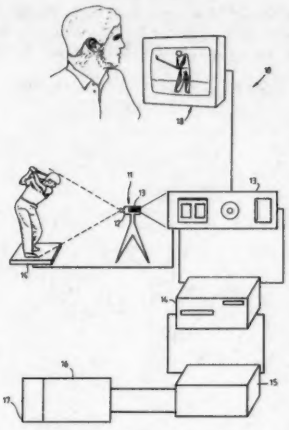
storing preferred image signals representative of a selected preferred movement at a second location remote from said first location in a data base of a computer,

transmitting said captured and stored visual image signals from said first location to said computer at said second location,

comparing said captured and stored image signals with stored preferred image signals in said data base of said computer,

regenerating further visual secondary image signals based on said initial image signals of said particular movement adjusted to emulate said stored preferred image signals of said selected movement in said computer, and

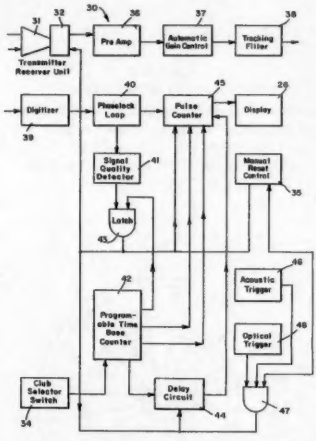
transmitting said regenerated signals from said computer at said remote second location to said first location and stored in image presentation means which permits viewing thereof with dialogue relating to said regenerated visual secondary image signals.



5,486,002
GOLFING APPARATUS

James L. Witler, Eagle-Vail, Colo.; Douglas L. Spike, Jacksonville, Fla., and Douglas C. Talbot, Eagle-Vail, Colo., assignors to Plus4 Engineering, Inc., Minturn, Colo.

Continuation of Ser. No. 170,587, Dec. 21, 1993, which is a continuation-in-part of Ser. No. 758,847, Sep. 11, 1991, Pat. No. 5,290,037, which is a continuation-in-part of Ser. No. 617,573, Nov. 26, 1990, Pat. No. 5,092,602. This application Dec. 23, 1994, Ser. No. 372,431
Int. Cl.[6] A63B *69/36*
U.S. Cl. 273—184 R **22 Claims**



1. A golfing apparatus for determining the carry distance of a golf ball which a golfer has struck, said golfing apparatus comprising:

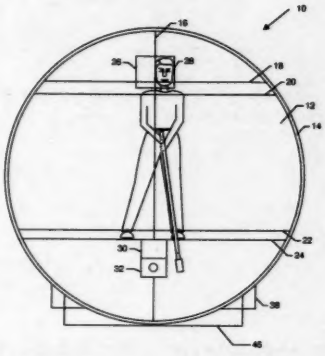
(a) a speed measuring mechanism which has a boresight and which measures a component of the speed of the golf ball, said speed measuring mechanism being aimed at the golf ball while in flight, wherein said boresight of said speed measuring mechanism is disposed at angle in the range of zero degrees to twenty five degrees with respect to level ground; and

(b) correlating means for correlating said measured component of the speed of the golf ball with an empirically derived factor for use in determining the estimated carry distance of the golf ball, said correlating means being electrically coupled to said speed measuring mechanism.

5,486,003
GOLF TRAINING SYSTEM

Ellen G. Loew, 139 E. Hampton Rd., Binghamton, N.Y. 13903, and Joseph D. Gaetani, 22 Helen St., Johnson City, N.Y. 13790

Filed Sep. 9, 1992, Ser. No. 942,300
Int. Cl.[6] A63B *69/36*
U.S. Cl. 273—187 R **21 Claims**



17. A golf training mirror for viewing a golfer's body to determine proper swing alignment comprising:

a. a convex mirror having a reflective surface generally free of lines for viewing reflection of a golfer's body;

b. at least one pair of horizontal lines on the reflective surface for alignment with a specific part of a golfer's body;

c. at least one rectangular box on the reflective surface for alignment with a second specific part of the golfer's body; and,

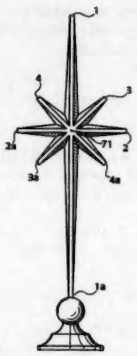
d. a vertical line generally bisecting the reflective surface for aligning the golfer's body.

5,486,004
RELEVANT CHESS PIECES

Charles P. Fogarty, P.O. Box 254, Commack, N.Y. 11725

Continuation-in-part of Ser. No. 867,272, Apr. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 607,803, Nov. 1, 1990, abandoned. This application Mar. 10, 1994, Ser. No. 209,422
Int. Cl.[6] A63F *3/02*
U.S. Cl. 273—260 **8 Claims**

1. The combination of chess pieces and a square checkered chess board, said chess board comprising peripheral borders defined by a first player end, a second player end and two sides, eight side-by-side rows of squares extending parallel with said ends and eight side-by-side columns of squares extending parallel with said sides, each of said chess pieces comprising a base, a three-dimensional body supported by said base and extending upwardly therefrom along a vertical axis, each said body of each said chess piece being formed to constitute means for indicating all of the directions each said chess piece may be moved from one said square to others of said squares of said board when said board is horizontally oriented and said piece is located within said one said square, said indicating means comprising three-dimensional projections extending radially about a horizontal axis, at least one of said each said body being formed for indicating permissive movement in at least one of the direction toward said second player end along diagonally



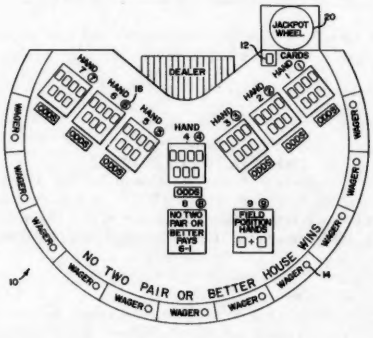
adjacent squares and the direction towards said first player end along diagonally adjacent squares.

5,486,005

METHOD AND APPARATUS FOR PLAYING A POKER-LIKE GAME

Michael D. Neal, Bloomington, Ill., assignor to Judith Neal, Executrix, Bloomington, Ill.

Filed Jan. 3, 1995, Ser. No. 367,835
Int. Cl.[6] A63F *1/00*
U.S. Cl. 273—292 **19 Claims**



18. An apparatus for playing a poker-like game in which at least one player plays against a dealer, said apparatus comprising:

a deck of fifty-two playing cards,

means for indicating each player's wager,

board means for providing predetermined positions for the display of a plurality of cards in a plurality of hands,

means for determining and displaying odds placed on each hand by the dealer, depending on the chance of that hand being the winning hand in accordance with predetermined guidelines, and

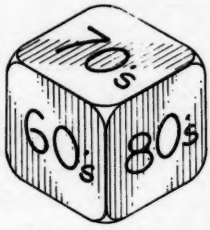
means for indicating each players selection of a hand.

5,486,006

MUSIC QUIZ GAME FOR AMUSEMENT

Michael Bruno, 2570 Madison Rd. Ste. #13, Cincinnati, Ohio 45208, and Andy Curran, 1063 Bruce Ave., Cincinnati, Ohio 45230

Filed Nov. 19, 1993, Ser. No. 154,950
Int. Cl.[6] A63F *1/00*
U.S. Cl. 273—301 **11 Claims**



1. A method of playing a music quiz game of amusement, comprising the steps of:

selecting at least two teams consisting of at least one player per team, a first team being the answering team and a second team being the questioning team;

a player from said answering team rolling a die having temporal indicia on at least some of the faces thereof;

a player from said questioning team selecting a card from a set of cards and posing a question to said answering team player requesting said answering team player to identify the artist of a song identified on said card by title and year, said year corresponding to the temporal category showing on the die rolled by said answering team player;

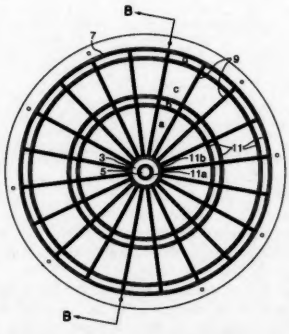
said answering team player responding within a predetermined time period to said question by attempting to identify the correct song artist.

5,486,007

AUTOMATED DART BOARD

Mark F. Stewart, St. Davids; Angelo A. Bonetta, Niagara on the Lake, and Majinder S. Phull, Mississauga, all of, Canada, assignors to High Flyte International Ltd., Bermuda

Filed May 9, 1994, Ser. No. 239,552
Int. Cl.[6] F41J *3/00;5/04*
U.S. Cl. 273—374 **30 Claims**

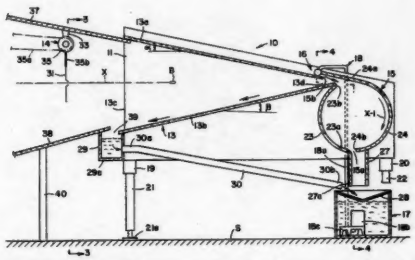


1. A target for use with a projectile, the target comprising:

a. a web made from conductive material, the web defining a target face, the web having a depth and the web defining one or more segments within the web that open toward the target face;

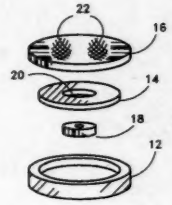
b. one or more conductive blocks slidably mounted and substantially filling the target face of one or more respective segments of the web, each block contacting the web;
c. a back board mounted to and behind the web, the back board having at least one conductive pad for each of the blocks;
d. a resilient cushion for each of the conductive blocks, between each block and the back board;
wherein the projectile impacting a block at the target face with sufficient force causes the block for that insert to slide within the web and contact a pad beneath that block, and
wherein the cushion beneath that block resiliently returns the block substantially to its original position.

5,486,008
BULLET TRAP
Ronald Coburn, Westfield, Mass., assignor to Passive Bullet Traps Limited, Douglas, Isle of Man
Filed Nov. 17, 1993, Ser. No. 154,023
Int. Cl.[6] F41J *1/12*
U.S. Cl. 273—410 **23 Claims**



1. A bullet trap for catching and deenergizing bullets fired along a substantially horizontal path of flight into the trap from manual firearms, which trap includes: a first pair of spaced flat plates located, respectively, above and below said path of flight and oriented at respective opposite angles of inclination of between 0° and about 15° to the horizontal, and a second pair of spaced flat plates arranged transverse to said first plates on opposite sides of said path of flight, with said first and second pairs of plates defining, respectively, upper and lower walls and right and left side walls of a passageway having at its front end an entrance opening and at its rear end a throat through which the bullets can pass, and with said upper and lower walls of said passageway converging toward one another in the direction from said entrance opening of said passageway to said throat; a spent bullet decelerating and energy-dissipating chamber which has a substantially horizontal axis and a circumferential boundary wall of generally spiral configuration, with the opposite end walls of said chamber being constituted by portions of said second plates, and with said passageway communicating with said chamber substantially tangentially of said chamber through said throat; means for directing a liquid lubricating fluid into said chamber for enabling said lubricating fluid to be applied to at least a portion of said circumferential boundary wall of said chamber; and means defining a collecting vessel located at a discharge region of the trap for receiving therefrom spent bullets, bullet fragments, shells, casings and lead dust; wherein the improvement comprises:
(a) said upper and lower walls of said passageway at said rear end of said passageway are connected to said decelerating chamber at a top region of said chamber, with said throat of said passageway located at said circumferential boundary wall of said chamber;
(b) said decelerating chamber is provided in said circumferential boundary wall thereof at said top region of said chamber with an inlet opening extending substantially parallel to said horizontal axis of said chamber and in direct communication with said throat of said passageway; and
(c) said decelerating chamber is provided in said circumferential boundary wall thereof at a bottom region of said chamber with a discharge opening for enabling liquid lubricating fluid, bullets, bullet fragments, shells, casings and lead dust to pass therethrough for movement to said collecting vessel;
(d) whereby bullets fired into said passageway through said entrance opening of said passageway first enter into said decelerating chamber through said throat and said inlet opening without undergoing a sudden high angle change of direction between said through and said inlet opening and without impacting against any wall surface at a high angle to that surface and then circumnavigate said chamber with gradually decreasing speed, while in contact with said circumferential boundary wall of said chamber and lubricated by said liquid lubricating fluid directed into said chamber, until the energy of the bullets has been substantially dissipated, and the bullets along with any bullet fragments, shells, casings and lead dust ultimately fall through said discharge opening of said chamber and move to said collecting vessel.

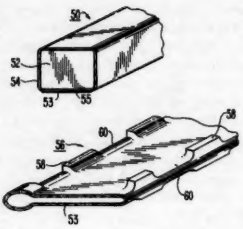
5,486,009
SLAMMER FOR USE IN PLAYING MILK CAP TYPE GAMES AND METHOD OF MANUFACTURE
Bruce Browne, Bonita, Calif., assignor to B and P Plastics, National City, Calif.
Continuation of Ser. No. 394,891, Feb. 27, 1995, Pat. No. 5,443,106, which is a continuation-in-part of Ser. No. 305,437, Sep. 13, 1994, Pat. No. 5,421,488. This application Apr. 7, 1995, Ser. No. 418,774
Int. Cl.[6] A63B *65/10*
U.S. Cl. 273—424 **10 Claims**



1. A slammer for playing Milk Caps type games, which comprises:
one apertured metal disk
a first synthetic resin housing portion surrounding a first face of said disk and the outer edges of said disk;
a second synthetic resin housing portion coveting the second face of said disk;
said second housing portion being formed from a softer resin than the resin forming said first housing portion.

5,486,010
GASKET MATERIAL FOR USE IN PLATE AND FRAME APPARATUS AND METHOD FOR MAKING AND USING SAME
Elizabeth M. Hamilton; Eric W. Lalli, both of Elkton; Cindy B. Lubin, Towson; Wanda F. Sparks, and Alfred F. Waterland, III, both of Elkton, all of Md., assignors to W. L. Gore & Associates, Inc., Newark, Del.
Continuation-in-part of Ser. No. 50,903, Apr. 20, 1993. This application Sep. 8, 1993, Ser. No. 118,372
Int. Cl.[6] F16J *15/10*
U.S. Cl. 277—1 **40 Claims**

1. A multiple layered plate and frame apparatus including a gasket, said gasket comprises:
a core of elongated polytetrafluoroethylene (PTFE);



means to constrain the core from lateral flow when placed under compressive pressure to establish and maintain a seal between multiple plates; the means comprising a tight film wrap around the PTFE core of sufficient tensile strength to limit creep of the PTFE core when the gasket is placed under pressure.

5,486,011

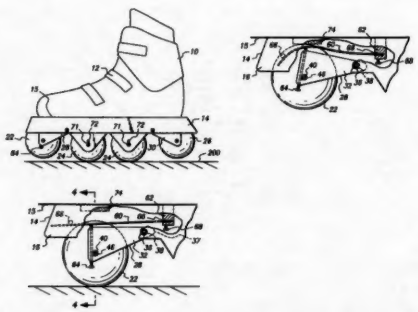
SPRING BIASED BRAKING DEVICE FOR IN-LINE ROLLER SKATES

Randy Nelson, 1075 Rollins Rd., #208, Burlingame, Calif. 94010

Filed Jun. 2, 1994, Ser. No. 252,915

Int. Cl.[6] A63C *17/06; 17/14*

U.S. Cl. 280—11.2 **20 Claims**



1. A braking device for an in-line roller skate comprising:

a base of said in-line skate extending substantially along a bottom surface of a boot for an in-line skate;

a bracket having substantially identical first and second bracket arms, each of said bracket arms having at a first end a means for mounting a skate wheel axle, and at a second end a means for pivotally mounting said bracket arms to said base wherein said bracket arms are spaced apart and substantially parallel whereby said bracket can pivot about an axis which is substantially transverse to the longitudinal axis of said base and substantially parallel to the plane of said base thus permitting the first end of said bracket arms to pivot towards and away from said base;

a skate wheel which is load bearing during normal skating movements;

an axle rotatably supporting said wheel during normal skating movements which axle is mounted between the first end of said bracket arms;

a braking surface on said base; and

a spring means for biasing said first end of said bracket arms to a position away from said base wherein said skate wheel is disengaged from said braking surface during normal skating movements and such that upon exerting additional downward force to said wheel the biasing is overcome by said additional force wherein said bracket pivots towards said base until said wheel frictionally engages said braking surface thus resulting in braking action.

5,486,012

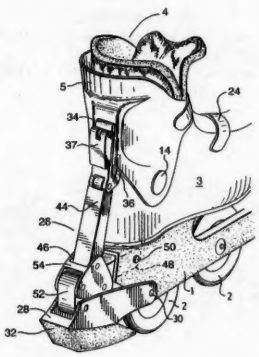
BRAKING SYSTEM FOR IN-LINE SKATES

Icaro Olivieri, Westmount, Canada, assignor to Canstar Sports Group Inc., Quebec, Canada

Filed Jun. 14, 1994, Ser. No. 260,374

Int. Cl.[6] A63C *17/14*

U.S. Cl. 280—11.2 **9 Claims**



1. A braking system for an in-line skate for a skater, where said skate comprises a boot/chassis assembly including a chassis carrying a plurality of in-line wheels to run on the ground, and a boot mounted above the chassis, said boot/chassis assembly including a plastic cuff securable around the skater's ankle and pivotally connected to said boot/chassis assembly at pivot points generally in the area of the skater's malleoli, said braking system comprising a linkage assembly connected at an upper end thereof to a rear portion of said cuff, and at a lower end thereof to a rotatable brake assembly, which brake assembly pivots about a pivot point mounted on said chassis and carries a replaceable brake pad, said brake assembly pivoting between a retracted position where said brake pad is above the ground, and a braking position where said brake pad is in contact with the ground, said linkage assembly comprising a drive arm, a transfer bracket and a short connector link;

said drive arm having an upper end and a lower end, said upper end being secured to the back of the cuff, to move upwardly and downwardly with rotation of the cuff;

said transfer bracket having three pivot points B, C, and D, where B is a pivotal connection between the lower end of said drive arm and an upper portion of said transfer bracket, C is a pivotal connection between a forward portion of said transfer bracket and support means rigidly positioned with respect to said boot/chassis assembly and extending rearwardly therefrom, and D is a pivotal connection between a rearward portion of said transfer bracket and an upper end of said short connector link;

said short connector link having an upper end and a lower end, said lower end being pivotally connected at a pivot point E to said brake assembly;

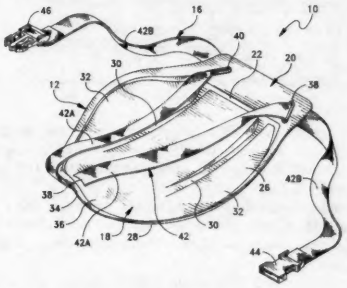
said pivot points B, C and D being arranged such that the mechanical advantage provided by said transfer bracket in translating downward movement of said drive arm to downward movement of said connector link and brake assembly is less than one in said retracted position, and increases as said cuff is rotated rearwardly to move said drive arm downwardly and said brake assembly towards the ground.

5,486,013

SLED CONSTRUCTION AND STRAP ASSEMBLY THEREFOR

Rein Kilk, Tartu, Estonia, and Madis Idarand, Providence, R.I., assignors to Pindi International, Ltd., Tartu, Estonia

Filed Oct. 17, 1994, Ser. No. 323,548
Int. Cl.[6] B62B *13/00*
U.S. Cl. 280—18.1 **12 Claims**



1. A sled construction comprising:

a sled including a generally concave body portion and a substantially planar flange portion which extends from a first end of said body portion, said body portion including an inner contoured surface which is received in conforming relation with the buttocks of a sledder and an outer surface having longitudinal runners extending downwardly therefrom, said body portion further including a second end opposite said first end which tapers inwardly and curves upwardly to form an apex received adjacent to a crotch of the sledder, said flange portion being received adjacent a waist of the sledder, said body portion still further including an opening adjacent said apex, said flange portion including two spaced openings therein; and

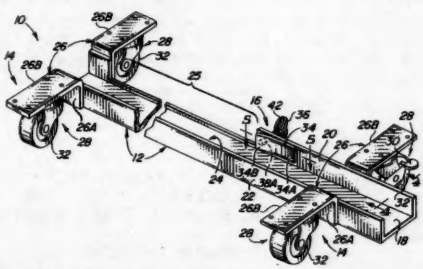
a strap assembly including a single strap and a fastening device for releasably fastening opposite ends of the strap together, said strap being threadedly received through said openings in said body portion and said flange portion and said strap extending around the thighs and the waist of the sledder for securing the sled thereto.

5,486,014

DOLLY HAVING ELONGATED CHANNEL WITH RELEASABLE FRICTIONAL SECUREMENT DEVICE

Darald F. Hough, 128 S. Sante Fe, Salina, Kans. 67401

Filed Mar. 8, 1994, Ser. No. 207,928
Int. Cl.[6] B62B *3/04*
U.S. Cl. 280—79.11 **4 Claims**



1. A dolly for use in supporting a lower end portion of a panel-shaped support leg of an upright piano, said dolly comprising:

(a) an elongated rigid support member formed by an elongated narrow bottom wall and a pair of laterally spaced side walls substantially coextensive with and rigidly connected along opposite longitudinal side edges of said bottom wall and extending upwardly therefrom and generally parallel to one another, said support member defining an elongated channel extending between said laterally spaced side walls and above said bottom wall, said channel being open along its upper end for receiving therethrough the lower end portion of the support leg, one of said side walls having a portion located between and spaced from opposite ends of said one side wall being cutout to define an elongated slot through which can extend a horizontal cross member which extends between the support legs at the respective opposite ends of the upright piano;

(b) carriage means mounted to opposite ends of said support member for supporting said support member in a spaced relationship above a support surface and for undergoing movement across the support surface, said carriage means including

(i) a pair of flanges respectively connected to and extending laterally outwardly in opposite directions from upper edges of said side walls of said support member at said opposite ends of said support member, and

(ii) a plurality of caster wheel assemblies mounted to undersides of said flanges for rollably mounting said support member; and

(c) a releasable frictional securement device adjustably mounted to said one of said side walls of said support member adjacent to an end of said slot and extendable into said channel for forceably engaging the lower end portion of the one support leg and thereby secure the dolly thereto, said securement device including

(i) a semi-flexible flat band disposed along the interior of a portion of said one side wall of said support member and attached thereto at one end of said band, and

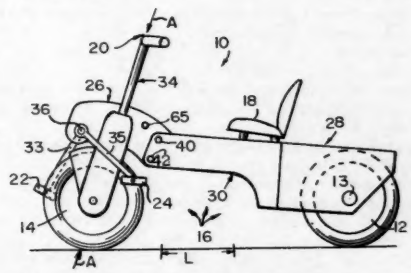
(ii) an adjustment element mounted to said one side wall for engaging an opposite end of said band at an inner end of said adjustment element for forcing said band into frictional contact with the surface of the lower end portion of the support leg.

5,486,015

HUMAN POWERED GROUND VEHICLE

James C. K. Lau, 19515 Redbeam Ave., Torrance, Calif. 90503

Filed Apr. 13, 1994, Ser. No. 226,898
Int. Cl.[6] B62K *5/04;9/00;15/00;* **B62M** *1/00*
U.S. Cl. 280—236 **12 Claims**



1. A human powered ground vehicle comprising: a vehicle frame having a forward end and a rearward end; a steering column hingedly connected to said vehicle frame and extending across said vehicle frame; a motive power input assembly supported by said frame and adapted to derive motive power from a physical exertion of force by a driver, said motive power input assembly including at least one pedal member adapted to revolve about a laterally extending axis which traverses said vehicle frame through an area located forward of said steering column; a plurality of wheels, including no more than a single front wheel mounted for rotation proximate said steering column; and at least one rear wheel

mounted for rotation proximate said rearward end of said vehicle; and means for transmitting power from said motive power input assembly to said front wheel, thereby permitting said vehicle to be driven, wherein said means for transmitting power includes a gear system positionally fixed with respect to said vehicle frame, a chain arrangement positionally fixed with respect to said steering column, and an intermediate power transmitting assembly mechanically communicating said gear system with said chain arrangement, said intermediate power transmitting assembly including first and second gear members wherein said first gear member is arranged inside of said second gear member to permit a mechanical communication therebetween.

5,486,016

WHEEL ASSEMBLY FOR A WHEELCHAIR, INCORPORATING A CHANGE SPEED HUB

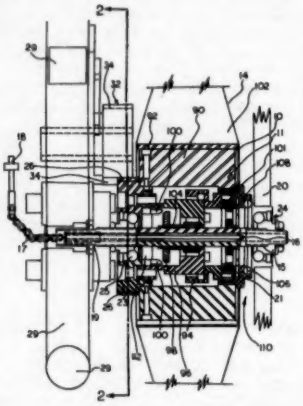
Gary Godin, 16 Francois Street, Paul Bernard Subdivision, Charlo, N.B. E0B 1M0, and Philip Lambert, Fredericton, both of, Canada, assignors to Gary Godin, Charlo, Canada

Filed Apr. 29, 1994, Ser. No. 235,273

Claims priority, application Canada, May 6, 1993, 2095681

Int. Cl.[6] **A61G** *5/00;* **B60K** *41/22;* **B62M** *1/14*

U.S. Cl. 280—250.1 **2 Claims**



1. A wheel assembly for a wheelchair having a frame member on each side of the seat, comprising:

a hollow hub;

a wheel mounted on said hub;

an axle extending through said hub, said axle having inner and outer ends, and means rotatably mounting said hub on said axle;

means for fixedly mounting said axle at its inner end on a frame member of a wheelchair;

means mounting a handwheel on said outer end of said axle;

a multiple speed gear assembly including pawls mounted in said hub, an output of said gear assembly connected to said hub and in input of the gear assembly connected to said handwheel, said gear assembly including axially stationary sun, planet and ring gears and having gears interconnected via said multiple speed gear assembly for both forward and reverse driving, and including gear change actuating means, each group of said pawls being engaged and disengaged by an inside-hub clutch movable by said gear change actuating means and means for moving said actuating means as desired to engage or disengage said clutches thereby change said gear; and

including a free wheel assembly positioned between said handwheel and said input to said gear assembly, to provide a one-way drive from said handwheel to said gear assembly for forward and reverse operation.

5,486,017

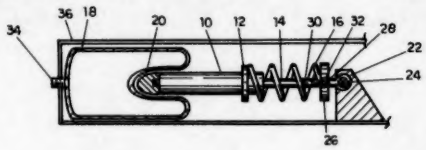
PNEUMATIC SUSPENSION SYSTEM DAMPENER

Franklin S. Goddard, 3111 S. Apache, Amarillo, Tex. 79103

Filed Jan. 31, 1995, Ser. No. 381,652

Int. Cl.[6] **B60G** *11/30;15/12*

U.S. Cl. 280—711 **8 Claims**



1. In a vehicle pneumatic suspension system including pneumatic suspension elements which absorb road shocks and vibrations for a wheel assembly, the improvement comprising:

a damper including,

a cylinder containing fluid and having a first end and a second end and an inner and an outer surface, said cylinder including a radial flange disposed about said cylinder outer surface,

a piston disposed within said cylinder having an axial bore interposed between a first and a second surface, said piston defining within said cylinder a first and a second volume, said axial bore providing fluid communication between said first and second volumes,

a piston rod interposed between said piston and a first vehicle mount and sealingly extending through an axial bore through said first end of said cylinder, said piston rod having a plurality of transverse holes disposed within that portion of said piston rod external to said cylinder,

a washer disposed about said piston rod having a transverse sleeve through which a pin may be received, said pin also being received in a selected one of said transverse holes disposed within said piston rod, and

a spring having a first end fixed relative to said radial flange disposed about said cylinder outer surface and a second end fixed relative to said washer disposed about said piston rod, wherein said spring biases said piston rod to a normal position relative to said cylinder; and

a variable-volume chamber having a first outer surface fixed to a second vehicle mount and a second outer surface fixed to said second end outer surface of said cylinder of said damper, said variable-volume chamber including a valve which provides communication with the pneumatic suspension elements which absorb road shocks and vibrations for a wheel assembly whereby,

a shock experienced by a vehicle wheel assembly is transmitted from the wheel assembly's pneumatic suspension elements to said variable-volume chamber and is absorbed by gas compression within said chamber and by said variable-volume chamber expanding against said second end outer surface of said cylinder which overcomes said biasing force on said piston rod and compresses said fluid in said cylinder and causes said fluid to flow through said axial bore disposed within said piston, said spring returning said damper to a normal position relative to said cylinder once the pressure impulse has subsided.

5,486,018

SUSPENSION SYSTEM FOR FOUR-WHEELED VEHICLES

Koji Sakai, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

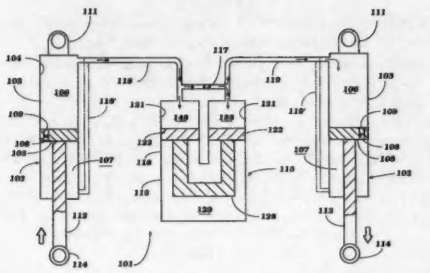
Filed Nov. 18, 1994, Ser. No. 342,248

Claims priority, application Japan, Aug. 5, 1994, 6-184756; Sep. 16, 1994, 6-221526

Int. Cl.[6] **B60G** *11/26*

U.S. Cl. 280—714 **112 Claims**

1. A suspension system for a vehicle having at least two wheels, each supported for suspension movement by the vehicle body, a



first damping element having a pair of relatively moveable members defining a first fluid chamber and interposed between one of said wheels and the vehicle body for varying the volume of said first fluid chamber upon suspension movement of said one wheel, first damping means for damping the flow of fluid from said first fluid chamber, a second damping element having a pair of relatively moveable members defining a second fluid chamber and interposed between another of said wheels and the vehicle body for varying the volume of said second fluid chamber upon suspension movement of said other wheel, second damping means for damping the flow of fluid from said second fluid chamber, a conduit interconnecting said first and said second fluid chambers, and control means in said conduit for precluding fluid flow through said conduit in response to a first suspension condition and for providing a damped flow through said conduit in response to a second suspension condition.

5,486,019

AUTOMOTIVE VEHICLE INCLUDING A SECURITY ARRANGEMENT PROVIDED WITH AN INFLATABLE PROTECTIVE BAG

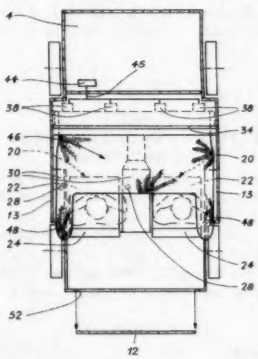
Tristan Chevroulet, Neuchatel, and Claude Beroud, Court, both of, Switzerland, assignors to SMH Management Services AG, Biel, Switzerland

Continuation of Ser. No. 934,721, Aug. 24, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 206,908

Claims priority, application Switzerland, Aug. 23, 1991, 91/10622

Int. Cl.[6] B60R *21/22*

U.S. Cl. 280—730.1 **9 Claims**



1. An automotive vehicle comprising a dashboard, side-by-side driver's and passenger's seats, steering control means for the vehicle including a steering handle positioned in close proximity to the driver's seat, the space between said dashboard and a driver being free, the dashboard having a top portion facing the windshield and a front portion facing the driver's and passenger's seats and comprising a compartment and a flap for closing said compartment, said flap being positioned in said front portion, a protective bag formed of supple material in said compartment, said bag being at least partially gas tight, the vehicle further comprising a gas source, means for coupling the bag to the gas source and means for automatically releasing the gas source in response to abnormal behavior of the vehicle, said bag having a folded non-operating first state in which it is entirely housed within the compartment prior to automatic release of the gas source, and an inflated operating second state in which it extends out of the compartment after automatic release of the gas source, said bag comprising a central portion which in the operating state is arranged so as to spread out over substantially the entire area of the dashboard, the central portion in such state being interposed between occupants of both driver's and passenger's seats and the dashboard.

5,486,020

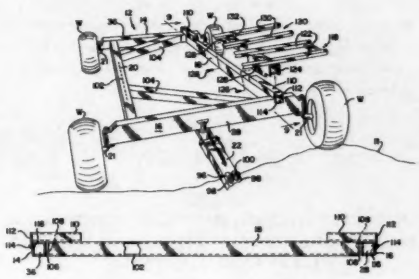
VEHICLE CHASSIS

Abe B. Kuhns, Arthur, Ill., assignor to E-Z Trail, Inc., Arthur, Ill.

Division of Ser. No. 877,414, May 1, 1992, Pat. No. 5,361,724. This application Aug. 5, 1994, Ser. No. 286,535

Int. Cl.[6] B62D *63/08;21/02*

U.S. Cl. 280—789 **16 Claims**



1. A flexible movable vehicle chassis comprising:

a pair of beams spaced from each other and extending substantially transversely to the direction of movement of the vehicle;

wheels mounted adjacent the ends of said transversely extending beams to rollably support the chassis for such movement;

a pair of longitudinally extending beams spaced from each other and extending between said transversely extending beams and substantially parallel to the direction of movement of the vehicle;

one of said longitudinally extending beams being substantially rigidly fixed adjacent each of its opposite ends to each of said transversely extending beams; and

the other of said longitudinally extending beams having at least one of its ends horizontally spaced from and loosely supported upon one of said transversely extending beams for substantial movement of said last mentioned end horizontally relative to said one transversely extending beam when at least one of said wheels encounters a substantial change of elevation of terrain relative to the other of said wheels during movement of the vehicle, said substantial horizontal movement of the end of said other longitudinal beam relative to said one transversely extending beam permitting the chassis to twist about an axis which is substantially parallel to the direction of movement of the vehicle.

5,486,021

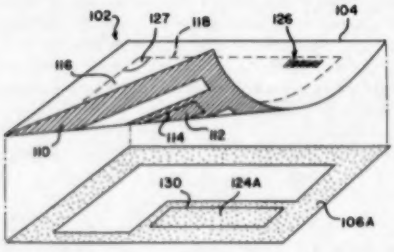
LABEL FOR OPERATION CONTROL SYSTEM

David F. Laurash, Bellbrook, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Continuation of Ser. No. 961,377, Oct. 15, 1992, Pat. No. 5,383,686. This application Jul. 18, 1994, Ser. No. 276,262

Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—81 5 Claims



1. A label form comprising:

a first sheet having a first portion on a first surface thereof entirely coated with an adhesive;

a second sheet located adjacent to said first sheet and having a second portion on a second surface thereof which is positioned adjacent to said first portion, said second portion being substantially coextensive with said first portion and having a first section coated with release material and a second section without release material.

5,486,022

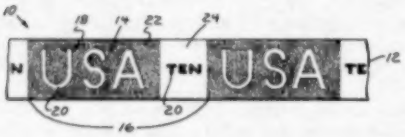
SECURITY THREADS HAVING AT LEAST TWO SECURITY DETECTION FEATURES AND SECURITY PAPERS EMPLOYING SAME

Timothy T. Crane, Windsor, Mass., assignor to Crane & Co., Inc., Dalton, Mass.

Filed Apr. 4, 1994, Ser. No. 222,657

Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—83 10 Claims



1. A security thread, suitable for at least partial incorporation in and for use on a security document or label which consists essentially of: a plastic thread having a width and having a layer located thereon wherein said layer comprises at least two security detection features, wherein a first security detection feature is a machine-readable feature which comprises a repeating pattern, wherein said pattern comprises at least one metal region and at least one electrically isolating region, in alternating sequence, wherein said metal region(s) and said electrically isolating region(s) extend across the entire width of said plastic thread, and wherein a second security detection feature comprises metal-formed indicia.

5,486,023

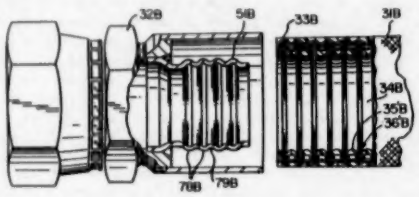
HOSE CONSTRUCTION, COUPLING THEREFOR AND METHODS OF MAKING THE SAME

John D. Sanders, Springfield, Mo.; Homer N. Holden, Sylva, N.C., and Randy C. Foster, Springfield, Mo., assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 149,585, Nov. 9, 1993, Pat. No. 5,380,050, which is a division of Ser. No. 988,983, Dec. 11, 1992, Pat. No. 5,297,822, which is a division of Ser. No. 875,865, Apr. 29, 1992, Pat. No. 5,199,752, which is a division of Ser. No. 693,109, Apr. 25, 1991, Pat. No. 5,129,686, which is a division of Ser. No. 408,161, Sep. 15, 1989, Pat. No. 5,037,143. This application Nov. 10, 1994, Ser. No. 337,600

Int. Cl.[6] F16L *33/213*

U.S. Cl. 285—258 8 Claims



1. In a hose construction comprising a tubular hose having an inner peripheral surface means and an outer peripheral surface means, and a coupling secured to one end of said tubular hose, the improvement wherein said inner peripheral surface means of said tubular hose comprises an inner corrugated hose made of polymeric material and having inwardly directed projections with recesses therebetween and extending from said one end of said tubular hose to the other end thereof and wherein said coupling has an insert means disposed in said one end of said tubular hose and being radially outwardly expanded into sealing relation with said inner corrugated hose, said insert means having an outer peripheral surface means defined by a plurality of outwardly directed projections with recesses therebetween, said projections of said insert means being respectively received in said recesses of said inner hose and said projections of said inner hose being respectively received in said recesses of said insert means whereby the interior of said tubular hose is substantially sealed to the interior of said coupling, said projections of said insert means each having a transverse cross-sectional configuration of a certain length that is different from the transverse cross-sectional length of each of said recesses of said inner hose., said insert means comprising a tubular metallic sleeve that has a metallic outer surface that is shaped to define said outer peripheral surface means thereof.

5,486,024

SOCKET FOR CONNECTING PIPE ENDS BY INJECTION OF ADHESIVE

Hans-Rolf Dierdorf, Langenfeld, Germany, assignor to Henkel Kommanditgesellschaft auf Aktion, Duesseldorf, Germany

PCT No. PCT/EP92/01847, § 371 Date Feb. 22, 1994, § 102(e) Date Feb. 22, 1994, PCT Pub. No. WO93/04311, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 18, 1992, Ser. No. 196,147

Claims priority, application Germany, Aug. 22, 1991, 41 27 775.9

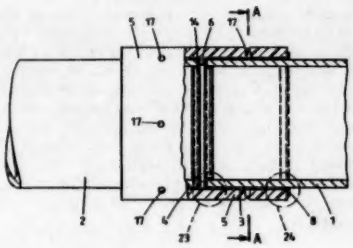
Int. Cl.[6] F16L *13/10*

U.S. Cl. 285—294 16 Claims

1. A socket for connecting pipe ends comprising, in combination:

(a) a tubular shell having opposing openings for receiving pipe ends to be joined, said tubular shell having an exterior face, an interior face and two end faces;

(b) abutment means integrally connected within said tubular shell for axially positioning said pipe ends within said tubular



shell, said abutment means extending radially from said interior face of said tubular shell;

(c) annular elements mounted onto said opposing openings of said tubular shell for both centering said pipe ends within said socket and creating an annular space, sealed at one end, between said interior face of said tubular shell and an outer surface of said pipe ends;

(d) annular flanges, separate from said tubular shell, for removable mounting onto said pipe ends and for centering said pipe ends within said socket and sealing said annular space formed between said interior face of said tubular shell and said outer surface of said pipe ends; and

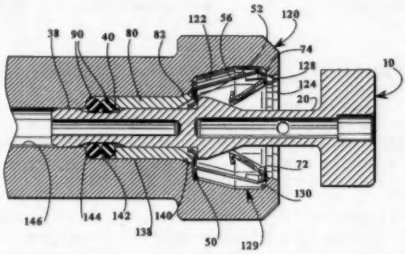
(e) at least one adhesive opening in said tubular shell of said socket for introducing an adhesive into said annular space and thereby joining said pipe ends inserted within said socket.

5,486,025

STUFFER PIN ASSEMBLY FOR QUICK CONNECTOR

Mark G. Ketcham, East China, Mich., assignor to Bundy Corporation, Warren, Mich.

Filed Sep. 29, 1994, Ser. No. 314,892
Int. Cl.[6] F16L *39/00*
U.S. Cl. 285—319 **12 Claims**



1. A stuffer pin assembly for carrying and loading internal components of a female connector body of a quick connector coupling, said quick connector coupling including a male member sealingly received and secured within said female connector body, said stuffer pin assembly comprising:

a component carrier having a cylindrical body and a radially enlarged portion formed at a first end of said cylindrical body, said body extending from said enlarged portion to a second end remote from said enlarged portion, said body including a frustro-conical nose formed at said second end, a first cylindrical wall extending from said nose to a groove, a second cylindrical wall extending from said groove to a lowermost extent of a radial shoulder, a third cylindrical wall extending from an uppermost extent of said shoulder to a large diameter end of a frustro-conical wall, and a fourth cylindrical wall extending from a small diameter end of said frustro-conical wall to said enlarged portion;

at least one seal secured on said component carrier within said groove;

a hollow spacer secured on said component carrier between said groove and said radial shoulder and surrounding said second cylindrical wall; and

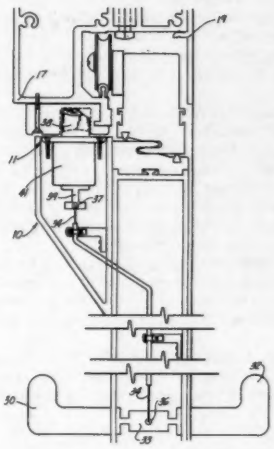
a retainer for retaining said male member in said connector body secured on said component carrier, said retainer including an annular ring surrounding said second cylindrical wall between said spacer and said radial shoulder, said retainer further including a plurality of legs extending away from said ring and toward said first end of said component carrier for engaging said connector body and thereby retaining said male member in said connector body.

5,486,026

DOUBLE-ACTING POSITIVE LATCH SYSTEM FOR SLIDING DOORS

Ronald Borgardt, 2316 Tifton St., Kenner, La. 70062

Filed Feb. 9, 1994, Ser. No. 193,953
Int. Cl.[6] E05C *19/06*
U.S. Cl. 292—71 **9 Claims**



9. In a positive bolt latching system for sliding doors of the type having a breakaway feature, and a first door slidable upon a track between open and closed positions, hinge means for allowing the sliding door to breakaway from the track, and to swing away from the track to effect a greater opening in a passageway; the improvement comprising:

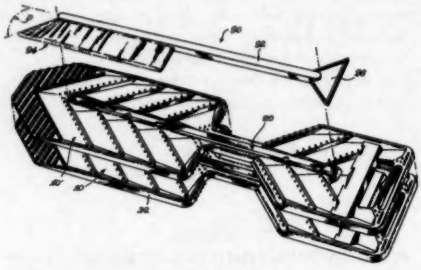
latching means positioned between the door and the door frame, for allowing the door to positively latch closed when the door is slid to the closed position, and to positively latch closed when the door is returned to the track after being broken away from the track, without manual latching in either position, the latching means further comprising a latch bolt engageable in an opening in a latch plate, the latch bolt having at least two beveled surfaces which, when either surface engages the latch plate, allows the bolt to retract so that it can engage into an opening in the latch plate, and effect the automatic positive latch.

5,486,027

COMBINED TRACTION MAT, SHOVEL AND UTILITY DEVICE

Alain Dionne, 1988 DeVilliers, and Benoit Corbeil, 2026 DeVilliers, both of Montreal, Canada

Filed Jul. 21, 1994, Ser. No. 278,321
Int. Cl.[6] A01B *1/20;* **E01H** *5/02*
U.S. Cl. 294—51 **9 Claims**



1. A combined shovel-traction and utility device adapted to be manipulated by a first hand and a second hand of a user said combined shovel-traction and utility device comprising:

a substantially flat and elongated body, said body having a top surface and a bottom surface, said body having

a first gripping section,

a second gripping section,

an intermediate section located between said first gripping section and said second section,

a corrugated pattern formed on said top surface of said first gripping section and said second gripping section of said body,

a first handle means for allowing said first hand of said user to grasp said first gripping section, said first handle means being formed in said first gripping section,

a second handle means for allowing said second hand of said user to grasp said intermediate section, said second handle means being formed by said intermediate section.

said body having a longitudinal axis dividing said body into a pair of symmetrical halves sections,

said body further comprising a substantially elongated longitudinal channel, said channel extending substantially colinearly with said longitudinal axis, from said first gripping section across said intermediate section and into said second gripping section,

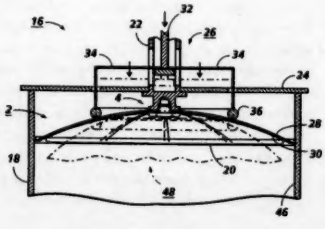
said channel having a substantially "U"-shaped cross-section defining a channel bottom wall and a pair of integrally and substantially perpendicularly extending channel side walls.

5,486,028

SUBSTRATE HOLDING APPARATUS

Eugene A. Swain, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 12, 1994, Ser. No. 304,443
Int. Cl.[6] B66C *1/54*
U.S. Cl. 294—93 **14 Claims**



1. A substrate holding apparatus comprising:

(a) a member comprised of a top surface, a bottom surface, a center region and a plurality of segments disposed around and integral with the center region, the segments being defined by a plurality of slits in the member, wherein the segments bend and overlap when subjected to a compressive force, thereby decreasing the width of the member, and wherein the extent of bending and overlapping of the segments spontaneously decreases when the compressive force lessens, thereby increasing the width of the member; and

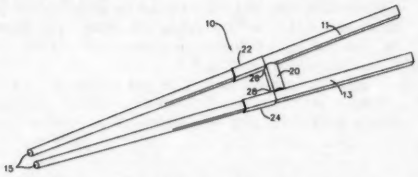
(b) compressive force means operatively associated with the member for controlling the amount of compressive force on the member.

5,486,029

APPARATUS FOR MANIPULATING CHOPSTICKS

David Kobayashi, 12404 Yellowhead Trail, Edmonton, Alberta, Canada

Filed Jan. 20, 1995, Ser. No. 375,671
Int. Cl.[6] A47G *21/10;* **A47J** *43/28*
U.S. Cl. 294—99.2 **2 Claims**



1. An apparatus for manipulating chopsticks, comprising:

a tubular polymer plastic body divided into a central portion and two wing portions by two transverse cuts, the size of the central portion being selected in accordance with a desired spacing between two chopsticks, each of the wing portions having axially extending bores of a size sufficient to accommodate a chopstick in friction fit relation, the transverse cuts extending only partially through the thickness of the tubular body leaving connective strips between the central portion and each of the two wing portions that serve as living hinges.

5,486,030

APPARATUS AND METHOD FOR LIFTING AND DEPOSITING BOTTLES HAVING HANDLES

Vincent Cobelo, Oldsmar, Fla., assignor to ABC Packaging Machine Corporation, Tarpon Springs, Fla.

Filed May 4, 1994, Ser. No. 238,219
Int. Cl.[6] B66C *1/66*
U.S. Cl. 294—113 **33 Claims**

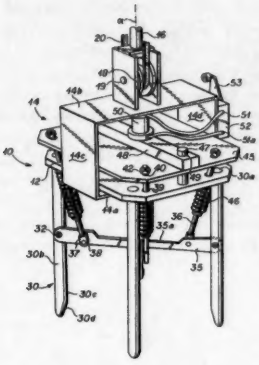
1. Apparatus for selectively engaging and disengaging a container having a handle protruding from it for transporting the container by its handle from one place to another, comprising:

(a) a movable frame;

(b) a plurality of fingers, each of said fingers having a proximal end and a distal end, said fingers being supported by their proximal end portions on said frame and protruding inwardly toward each other so that their distal ends terminate in a normal position adjacent to each other;

(c) means for moving said movable frame toward and away from said container when said container is in an initial position;

(d) means for manipulating said fingers to permit withdrawal of the distal ends of said fingers in an upwardly path with respect to said frame from each other for passing on opposite sides of said handle when said frame is moved downward toward said container and for enabling the distal ends of said fingers to move toward each other and to said normal position and between said handle and said container after said fingers have passed said handle;



(e) said means for moving said frame being adapted to move said frame away from said initial position of said container so that said container is carried by said fingers in said normal position with said fingers engaging said handle;

(f) said means for moving said frame being adapted to position said container on a receiving surface;

(g) said means for manipulating said fingers, being adapted for moving said distal ends of said fingers in a downward path and away from each other for releasing said handle; and

(h) said means for moving said frame being adapted to move said frame away from said container while said distal ends of said fingers are moved downwardly and away from each other for thereby releasing said container on its receiving surface.

5,486,031

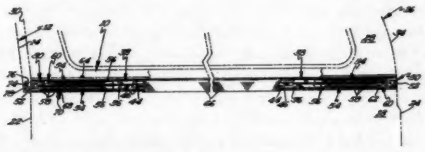
SLIDEABLE MOUNTING ASSEMBLY FOR PICKUP TRUCK TOPPERS

David K. Ronchetti, 14201 Aspen Ave. NE., Prior Lake, Minn. 55372; Robert A. Ronchetti, 3018 - 6th Ave. East, and William L. Ronchetti, 1110 E. Howard St., both of Hibbing, Minn. 55746

Filed Mar. 15, 1994, Ser. No. 213,261

Int. Cl.[6] B60P *3/32*

U.S. Cl. 296—10 **36 Claims**



1. Assembly comprising, in combination: a first slide having a first slide surface, a first end, and a second end; a second slide having a first slide surface, a first end, and a second end, with the first slide surfaces of the first and second slides having complementary shapes allowing relative sliding of the first and second slides parallel to the first slide surfaces and allowing separation of the first and second slides by movement perpendicular to the first slide surfaces; means secured adjacent the first ends of the first and second slides and secured adjacent the second ends of the first and second slides for interlocking the ends with the slides in an interlocking position, with the interlocking means when secured to the slides preventing separation of the slides in the interlocking position by movement perpendicular to the first slide surfaces, with the interlocking means when secured to the slides preventing the slides from sliding parallel to the first slide surfaces beyond the interlocking position in a first direction, with the interlocking means when secured to the slides allowing sliding of the slides parallel to the first slide surfaces from the interlocking position opposite to the first direction; and means for preventing relative sliding of the first and second slides parallel to the first slide surfaces opposite to the first direction.

5,486,032

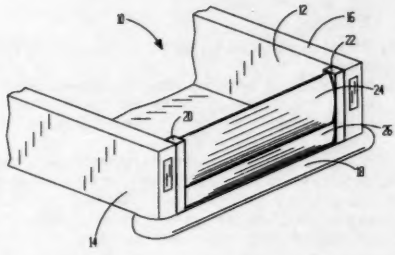
TAILGATE WITH AIR FOIL

Russ A. Reed, 506 Cranbrook, and Brian A. Jones, 1602 Lancelot Cir., both of Grand Prairie, Tex. 75050

Filed Nov. 22, 1994, Ser. No. 343,777

Int. Cl.[6] B62D *35/00*

U.S. Cl. 296—50 **8 Claims**



1. A tailgate with an integrated air foil mechanism for a pickup truck having an open top cargo area defined by three side walls and an open trailing end, comprising:

first and second control frames mounted on opposite ones of the pickup truck side walls, respectively, proximate to the open trailing end of the cargo area;

a main air foil wing having two ends, a convex side and a concave side, each end pivotally mounted to one said control frame, such that said main air foil wing spans the open trailing end between said control frames; and

a control apparatus mounted in at least one of said control frames, said control apparatus operable to cause said air foil to be positioned substantially parallel with said control frames in a substantially vertical position until the pickup truck reaches a sufficient speed wherein said control apparatus permits the main air foil wing to pivot such that it is substantially horizontal;

said control apparatus having:

a timing sprocket mounted on said pivot shaft inside of said first and second control frames,

a toothed tensioner pulley mounted on a tensioner spring, and

a toothed timing belt positioned around a portion of the circumference of said timing sprocket and said toothed tensioner pulley.

5,486,033

SUPPORT SHAFT FOR A VEHICLE SUN VISOR

René Lecorvaisier, Hombourg-Haut, and Christian Buchheit, Ham Sous Vasberg, both of, France, assignors to Gebr. Happich GmbH, Germany

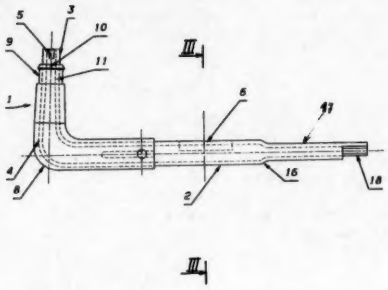
Filed Oct. 3, 1994, Ser. No. 316,858

Claims priority, application Germany, Nov. 13, 1993, 43 38 860.4

Int. Cl.[6] B60D *3/00*

U.S. Cl. 296—97.13 **10 Claims**

1. A support shaft assembly for a sun visor of a vehicle, the vehicle having a ceiling provided with a bearing bracket for receiving the support shaft assembly, the sun visor having a body with a mounting housing formed therein, the mounting housing having a detent spring disposed thereon, the sun visor body being pivotable around a swing axis extending axially through the mounting housing, the support shaft assembly comprising:



an L-shaped support shaft having a diameter, the support shaft including:

a short arm having a free end, the free end having a diameter smaller than the diameter of the shaft, the short arm being receivable within the bearing bracket disposed on the vehicle;

a long arm adapted to be received within the mounting housing along the swing axis of the sun visor body, such that the sun visor body is rotatable around the long arm, the long arm including a flat for receiving the detent spring so that the sun visor body rests against the ceiling of the vehicle when the sun visor is not in use, the long arm further including a free axial end provided with a radial opening; and

a bend joining the short arm and the long arm; and

a plastic body formed over the bend of the support shaft, the plastic body including:

a first end disposed over the short arm of the support shaft and terminating before the free end of the short arm, the first end of the plastic body having a mounting shank formed thereon for mounting the support shaft to the bearing bracket; and

a second end disposed over the long arm of the support shaft and terminating before the flat of the long arm.

5,486,034

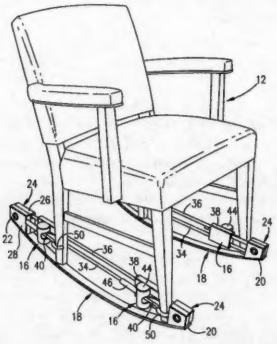
ROCKER APPARATUS

Donell R. Dalke, 1832 N. McComas, Wichita, Kans. 67203

Filed Nov. 10, 1994, Ser. No. 336,993

Int. Cl.[6] A47C *3/02*

U.S. Cl. 297—272.1 **15 Claims**



1. A rocker apparatus configured for detachably coupling with a piece of furniture having at least two legs depending therefrom for converting the furniture into a rocking device, comprising:

an arcuate rocker member including an elongated curved rocker bar presenting opposed distal and proximal ends and an adjustment rail extending between said ends;

a grasping assembly attached to said arcuate rocker member for grasping the furniture legs and coupling said arcuate member to the furniture, said grasping assembly including a grasping arm which is pivotal between a leg securing position wherein said grasping assembly grasps the furniture and a leg release position wherein said grasping assembly releases the furniture; and

adjustment means for selectively positioning said grasping assembly along the length of said adjustment rail.

5,486,035

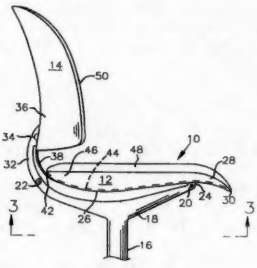
OCCUPANT WEIGHT OPERATED CHAIR

Marcus C. Koepke, 302 Farwell, and Earl H. Koepke, 65896 Scenic View Dr., both of Sturgis, Mich. 49091

Filed Aug. 1, 1994, Ser. No. 283,553

Int. Cl.[6] A47C *1/02*

U.S. Cl. 297—320 **7 Claims**



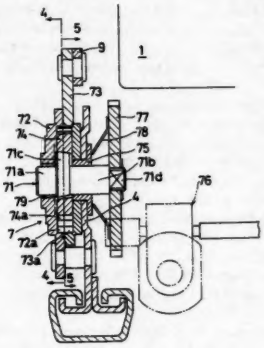
1. An occupant weight operated chair having a seat and a reclining back wherein the force required to recline the back is substantially uniform throughout the range of reclining movement and is controlled by the chair occupant's weight comprising, in combination, a seat formed of a stiffly flexible material having front and rear portions, and a concave upper configuration and a convex lower configuration between said portions, a back having upper and lower portions and a rear exterior surface, a transition connection portion formed of a stiffly flexible material interposed between and interconnecting said seat rear portion and said back lower portion, said transition connection having a concave upper configuration and a convex lower configuration between said seat and back, a support having a front attachment to said seat front portion and a rear pivot located rearwardly of the point of attachment of said seat rear portion to said transition connection portion, a link pivotally mounted on said support rear pivot and affixed to said back lower portion at a fixed predetermined position defining a rear attachment, the dimension between said front attachment to said rear attachment along the configuration of said seat and transition connection being greater than the straight line dimension between said front and rear attachments whereby reclining of said back about said pivot to deform said transition connection and seat rear portion raises said seat rear portion, the chair occupant's weight upon said seat rear portion automatically adjusting the force required to recline said back.

5,486,036

SEAT-HEIGHT ADJUSTING DEVICE

Sadao Ito, and Hiroshi Nawa, both of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Sep. 17, 1993, Ser. No. 123,089
Claims priority, application Japan, Sep. 18, 1992, 4-249323
Int. Cl.[6] A47C *1/02*
U.S. Cl. 297—339 **8 Claims**



1. A seat height adjusting device disposed between a frame supporting a seat-cushion and an upper rail slidably supported by a lower rail for fixing to a vehicle-floor, the seat height adjusting device comprising:

a bush secured to the upper rail;

a supporting shaft having a first true round portion, a tapered eccentric portion and a second true round portion, the second true round portion being rotatably mounted in the bush, the bush and the rotatably mounted supporting shaft being movable in a lateral direction along the vehicle floor:

a first gear secured to the upper rail rotatably supporting the supporting shaft at the first true round portion and having an inner teeth portion;

a second gear linked to the frame and supported on the bush, and having an inner teeth portion having teeth differing in number from that of the inner teeth portion of the first gear;

an intermediate gear mounted on the tapered eccentric portion of the supporting shaft, having an outer teeth portion in engagement with the inner teeth portions of the first gear and the second gear and having a different number of teeth than each of the inner teeth portions of the first and second gears; and

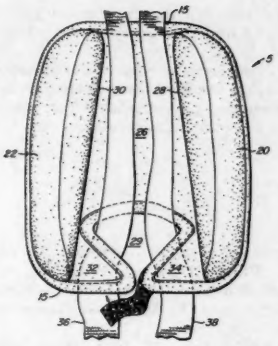
means for urging the supporting shaft axially in order to tighten connection between the tapered eccentric portion of the supporting shaft and the intermediate gear.

5,486,037

INFANT HEADREST FOR CHILD SAFETY SEAT

Marge Harper, Littleton, Colo., assignor to Century Products Company, Macedonia, Ohio

Filed Nov. 4, 1994, Ser. No. 334,520
Int. Cl.[6] A47C *7/38*
U.S. Cl. 297—397 **7 Claims**



1. An infant headrest support for automobiles comprising, in combination:

a pair of automobile shoulder belts;

a headrest comprising a front portion for engaging an infant's head, said front portion being substantially flat and planar, and a back portion, said back portion having a pair of pillow sections spaced apart from one another and extending along the length of said headrest to form a recess running the length of said headrest along said back portion, and a pair of flaps;

an opening in said headrest, said flaps allowing access to said opening, said automobile shoulder belts passing through said opening, behind said front portion and passing through said recess formed between said pillow sections in said back portion;

wherein said flaps are selectively opened and secured to allow access to said opening by said shoulder belts, in order to secure said pair of automobile shoulder belts to said headrest.

5,486,038

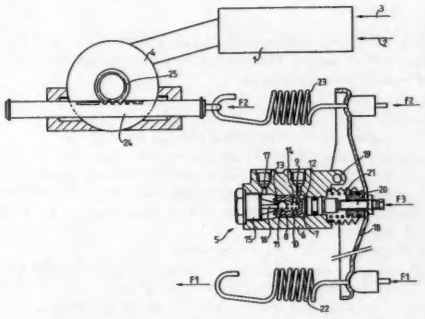
Patent Not Issued For This Number

5,486,039

ELECTRO-HYDRAULIC BRAKING CORRECTOR

Jean-Paul Petiot, Marcoussis, France, assignor to Automobiles Peugeot, Paris, and Automobiles Citroen, Neuilly sur Seine, both of, France

Filed Jul. 13, 1993, Ser. No. 90,956
Claims priority, application France, Jul. 28, 1992, 92 09589
Int. Cl.[6] B60T *8/18*
U.S. Cl. 303—22.6 **4 Claims**



1. Electro-hydraulic braking corrector for an electrically-powered vehicle, comprising:

means for sensing the braking torque of an electric propulsion motor;

means for modifying the hydraulic pressure exerted by a braking system as a function of the sensed braking torque of the electric propulsion motor, being connected to the means for sensing the braking torque;

wherein the means for modifying the hydraulic braking pressure as a function of the braking torque of the electric motor comprises means that is mobile as a function of said sensed braking torque, and a servo-controlled braking compensator

operable for connection in the brake system between a master cylinder and a slave cylinder, and connected to the mobile means; and

wherein the compensator is connected to an articulated link having two ends, one end of the link being connected to the vehicle suspension by a first spring and the other end of the link being connected to said mobile means by a second spring.

5,486,040

BRAKE PRESSURE CONTROLLER FOR A HYDRAULIC VEHICLE BRAKE SYSTEM

Erhard Beck, Weilburg, and Dieter Dinkel, Eppstein, both of, Germany, assignors to ITT Automotive Europe GmbH, Germany

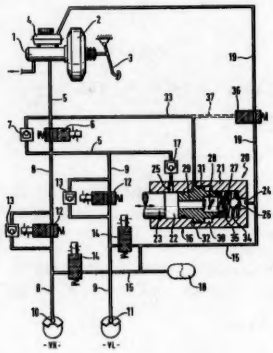
PCT No. PCT/EP92/01863, § 371 Date Aug. 25, 1994, § 102(e) Date Aug. 25, 1994, PCT Pub. No. WO93/08053, PCT Pub. Date Apr. 29, 1993

PCT Filed Aug. 14, 1992, Ser. No. 211,741

Claims priority, application Germany, Jan. 16, 1991, 41 34 214.3

Int. Cl.[6] B60T *8/34;8/48;8/42*

U.S. Cl. 303—113.2 **10 Claims**



1. A brake system for controlling fluid pressure in a wheel brake during normal braking, brake slip control and traction slip control, said brake system comprising:

a wheel brake;

a brake pedal;

a pressure fluid reservoir containing a pressure fluid;

a master brake cylinder in fluid communication with said pressure fluid reservoir and responsive to movement of said brake pedal for developing a pressure build up of pressure fluid in said master brake cylinder in response to actuation of said brake pedal;

a pump having an inlet and an outlet;

an auxiliary source of pressure fluid containing pressure fluid in fluid communication with said inlet of said pump;

first control means extending between said master brake cylinder and said wheel brake for:

(a) controlling pressure fluid flow from and to said master brake cylinder,

(b) permitting pressure fluid flow between said master brake cylinder and said wheel brake during normal braking as said brake pedal is actuated and without sensing a tendency of wheel lock,

(c) regulating pressure fluid flow to said wheel brake during brake slip control as a tendency of wheel lock is sensed, and

(d) preventing pressure fluid flow through said first control means to said master brake cylinder during traction slip control as wheel slippage is sensed;

second control means extending between said inlet of said pump and said pressure fluid reservoir for:

(a) preventing pressure fluid flow between said pressure fluid reservoir and said inlet of said pump during normal braking and brake slip control, and

(b) permitting pressure fluid flow between said pressure fluid reservoir and said inlet of said pump during traction slip control;

a pressure holding valve, disposed at said inlet of said pump, including a housing defining a cylindrical bore and including:

(a) a piston axially slidable within said cylindrical bore,

(b) a valve ball taking support on said piston through a first and a second compression spring which are arranged in series,

(c) a stop sleeve coupled to said piston, and

(d) a spring retainer disposed between said first and second compression springs and supported by said stop sleeve for placing said first compression spring under a greater preload than said second compression spring;

said pressure holding valve for:

(a) permitting pressure fluid flow from said wheel brake to said pump only when the pressure of said wheel brake exceeds an opening pressure in excess of atmospheric pressure:

(i) when pressure fluid flow between said master brake cylinder and said wheel brake is permitted during normal braking, and

(ii) when pressure fluid flow between said master brake cylinder and said wheel brake is regulated during brake slip control, and

(b) permitting pressure fluid flow from said pressure fluid reservoir to said pump upon activation of said pump in the absence of pressure fluid flow from said master brake cylinder to said first control means when said brake pedal is not actuated during traction slip control; and

third control means extending between said outlet of said pump and said first control means for conducting pressure fluid flow from said outlet of said pump to said first control means during brake slip control and traction slip control.

5,486,041

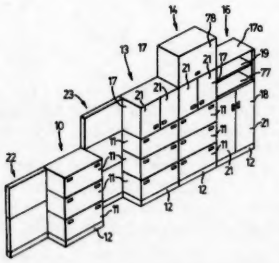
CABINET STRUCTURES COUPLED TO ADJACENT CABINET STRUCTURES AND TO RECTANGULAR FRAME ELEMENTS, AND EQUIPPED WITH ANTI-TILT MECHANISMS AND ROLLING AND SLIDING BASES

Christopher C. Sykes, Toronto, Canada, assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed May 26, 1994, Ser. No. 249,606

Int. Cl.[6] F16B *12/10*

U.S. Cl. 312—111 **14 Claims**



1. Cabinet structure coupling to a superadjacent similar cabinet structure, each such cabinet structure comprising interconnected side, top and back panels, and base structure comprising a downwardly facing channel connected at least to the side panels, the side and top panels having interengaging bevelled edge surfaces, and at least one channel section recess formed in at least one of said bevelled edge surfaces and extending outwardly to define an opening on an outer corner edge of the cabinet structure, and, in

combination therewith, a coupling member connecting to the base structure of said superadjacent cabinet structure and having a rectangular tab portion inserted in said opening and an elongated web portion seating in said downwardly facing channel of said superadjacent similar cabinet structure and said tab portion inclining generally longitudinally away from one end of said web portion generally toward an opposite end thereof.

5,486,042

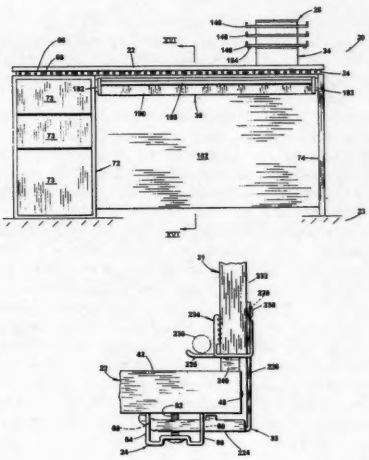
FURNITURE ARRANGEMENT

William A. Heisler, East Grand Rapids; David A. Shipman, Grand Rapids; Anthony A. Stachowiak, Belmont, all of Mich.; Kurt S. Bodden, Hudson, Ohio; Michael E. Wurth, Grand Rapids, Mich., and Norbert Dellekoenig, Effingham, Ill., assignors to Steelcase, Inc., Grand Rapids, Mich.

Filed Sep. 9, 1993, Ser. No. 118,895

Int. Cl.[6] A47B *17/00*

U.S. Cl. 312—196 **29 Claims**



1. A furniture unit for workstations, comprising:

a worksurface including a top surface, a bottom surface, and marginal edges extending therebetween;

a rail attached to the bottom surface of said worksurface, and extending along at least one of said marginal edges, said rail including a plurality of first apertures;

a support connected to said rail for supporting said worksurface at a predetermined height above a floor surface;

a plurality of accessory units configured for use on said workstation; and

means for releasably selectively mounting at least one of said accessory units to said rail along the one marginal edge of said worksurface, and positioning said one accessory unit above said worksurface, said means for releasably selectively mounting including a bracket with a bayonet-like leg releasably engageable with one or more of said first apertures whereby said one accessory unit can be located to personalize and equip said furniture unit.

5,486,043

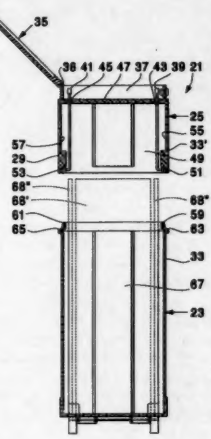
CARRYING CASE HAVING DETACHABLE STEP STOOL

Arthur G. Carr, Washington, D.C.; Christopher A. Durgin, Springfield, Va.; William D. Griffiths, Annandale, Va., and J. Alexander Hill, Alexandria, Va., assignors to Nomadic Structures, Inc., Springfield, Va.

Filed Feb. 18, 1994, Ser. No. 198,775

Int. Cl.[6] A47B *81/00*

U.S. Cl. 312—235.1 **23 Claims**



1. A carrying case assembly having a detachable step stool, comprising:

a carrying case portion including one or more first side walls, the first side walls defining a first interior space and a first top opening;

a step stool portion including a top portion and one or more second side walls, the second side walls defining a second interior space and a bottom opening;

means for attaching the step stool portion to the carrying case portion such that the first and the second interior spaces, together, form a third interior space;

the step stool portion being removable from the carrying case portion and being adapted to support a person thereon; and

one or more removable panels for defining vertical spaces in the first interior space, an interior surface of the first side walls being formed with one or more pairs of vertical grooves for receiving opposite edge portions of the panels.

5,486,044

COOLER DOOR DISPLAY RACK

James L. Bennett, 7516 Hayes Cir., Ralston, Nebr. 68127

Continuation-in-part of Ser. No. 833,107, Feb. 10, 1992, Pat. No. 5,330,261. This application Apr. 29, 1994, Ser. No. 235,644

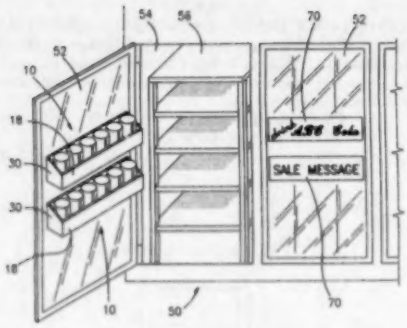
The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.

Int. Cl.[6] A47F *5/00;3/06*

U.S. Cl. 312—321.5 **13 Claims**

1. A cooler door display rack for a cooler having a frame at least partially defining a cooling compartment, a transparent door pivotally mounted on said frame and having interior and exterior faces, storage racks mounted in vertically spaced apart relation within the cooling compartment and in horizontally spaced relation from the door, the space between the door and the storage racks defining a cooling air flow zone, the cooler door display rack comprising,

an elongated support shelf of a shape for supporting a plurality of beverage containers generally in a row, said shelf having front, back and side peripheral edges,



retention means operatively associated with said support shelf for retaining beverage containers thereon and obstructing sliding movement of beverage containers off of said shelf, said retention means including a first front wall, rear retention means and side retention means, said first front wall attached to said elongated support shelf adjacent said front edge, said first front wall extending upwardly from said elongated support shelf,

said first front wall having a greater surface area than said rear retention means and said side retention means,

advertising display means operatively associated with said support shelf for removably and replacebly receiving and supporting advertising indicia in upright relation adjacent said front edge,

said advertising display means being of a size and shape such that advertising indicia supported therein cover at least half the area of said first front wall, and

securement means for securing said shelf to the inside surface of a transparent door such that advertising indicia supported on said advertising display means is arranged adjacent to and visible through the transparent door.

5,486,045

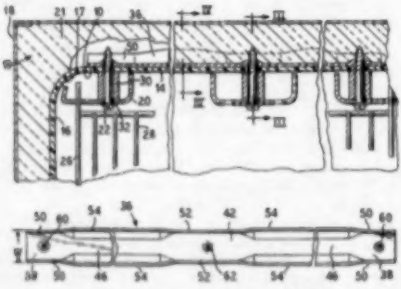
SHELF LADDER REINFORCEMENT MEMBER FOR A REFRIGERATION APPLIANCE

James F. Dasher, Center Township, Vanderburgh County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 1, 1993, Ser. No. 143,587

Int. Cl.[6] A47B *96/04*

U.S. Cl. 312—406 **13 Claims**



1. A shelf ladder reinforcement member comprising:

a member with a length greater than a width and with end portions having a first flat face with a width substantially the same as the width of said member,

at least one intermediate portion having a second flat face adjoining said first flat faces, said second flat face having a width less than the width of said member,

side walls extending from said first flat face at approximately 270°, and alternatingly

side walls extending from said second flat faces at an angle in the range of 185°–265°.

5,486,046

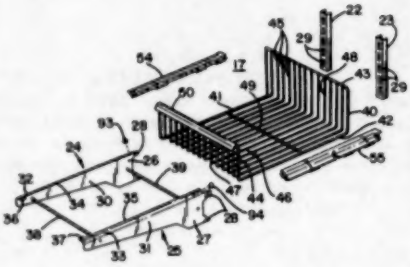
CANTILEVER SLIDE OUT REFRIGERATOR SHELF

Nana B. Jernstrom, and Jeffrey N. Wilson, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 24, 1994, Ser. No. 265,215

Int. Cl.[6] A47B *96/06*

U.S. Cl. 312—408 **10 Claims**



1. A refrigerator storage assembly comprising:

a pair of elongated support members for mounting in spaced apart, side-by-side relationship within a refrigerator; each of said support members including an elongated storage structure support surface extending front to rear within the refrigerator and a flange extending along said support surface and projecting toward the other of said support members;

a storage structure of open wire construction including a bottom having a plurality of longitudinally elongated rods extending in spaced apart, side-by-side relationship front to rear of said storage structure;

a pair of elongated mounting members, each of said mounting members including elongated walls forming a recess to receive one of a corresponding pair of rods along a corresponding lateral edge of said storage structure and each of said mounting members also including an additional wall and ribs forming spaced apart detents to receive the other of said corresponding pair of rods for mounting said mounting member to said storage structure by inserting its recess around said corresponding one of said corresponding pair of said rods and then rotating said mounting member to bring its detents into register with said corresponding other of said corresponding pair of said rods;

each of said mounting members having an elongated mounting surface resting on said support surface of a corresponding support member for. Sliding movement of said storage structure between a first position fully received within the refrigerator and a second position partially out of the refrigerator; and

each of said mounting members having at least one lip extending downward inside and outward under said flange of said corresponding support member.

5,486,047

MIXING AUGER FOR CONCRETE TRUCKS

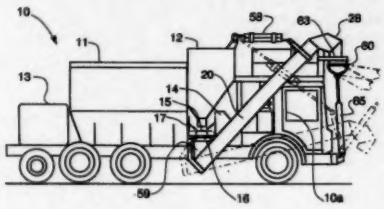
Harold M. Zimmerman, R.D. #1, Wabash Rd., Ephrata, Pa. 17522

Filed Jun. 5, 1995, Ser. No. 465,460

Int. Cl.[6] B28C *5/24;* **B01F** *7/08*

U.S. Cl. 366—50 **20 Claims**

1. A mixing auger apparatus for use in combining a plurality of material components to create a mixture, at least one of said component materials including chunks, comprising:



a mixing auger having an elongated central shaft and spiral flighting affixed thereto, said shaft being mounted for rotation and having an inlet end and a discharge end;

a flexible housing circumferentially surrounding said mixing auger and defining a chamber cooperable with said flighting to permit said flighting to convey said materials from said inlet end to said discharge end upon rotation of said shaft, said flexible housing being operable to flex radially relative to said shaft to prevent said material chunks from wedging between said flighting and said housing, said housing defining an inlet opening corresponding to said inlet end of said mixing auger to permit the introduction of said component materials to said inlet end and a discharge opening corresponding to said discharge end of said mixing auger to permit said mixture to be discharged from said discharge end; and

means for rotating said central shaft.

5,486,048

APPARATUS FOR TREATING DOUGH

Helmut König, deceased, late of Graz, Austria, and Elisabeth König, heiress, Ursprungweg 70, Graz, Austria

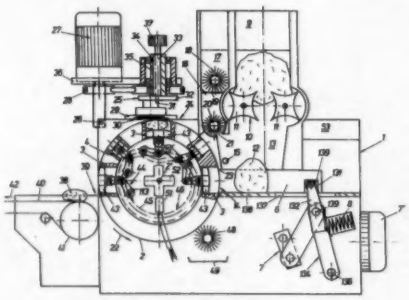
PCT No. PCT/AT92/00089, § 371 Date Jan. 10, 1994, § 102(e) Date Jan. 10, 1994, PCT Pub. No. WO93/00818, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 9, 1992, Ser. No. 178,289

Claims priority, application Austria, Jul. 12, 1991, 1412/91

Int. Cl.[6] A21C *5/04;7/06;7/04;9/04*

U.S. Cl. 366—76.8 **15 Claims**



1. Apparatus for the treatment of dough comprising:

a drum having a longitudinal axis, said drum being mounted for rotation around said axis, said drum including radially inwardly extending openings on an outer peripheral surface of the drum for receiving dough portions;

a first station for introducing dough portions into said openings;

a second station for treating the dough portions received in the openings;

a third station for ejecting the dough portions from the openings, said first, second and third stations being disposed near the periphery of the drum and further being spaced circumferentially around the periphery of the drum;

means for rotating the drum in stepwise increments;

a plurality of pistons, each respectively arranged for sliding radial movement within a corresponding one of said openings;

curved guide means associated with said plurality of pistons for positively guiding inward and outward radial movement of the pistons during at least one phase of treatment, said guide means being mounted for rotation around the axis of drum, said guide means having a predetermined starting rotational position, said guide means comprising at least two curved path sections carried on at least two cam members, said cam members being received in assembled relation such that said curved path sections cooperate to form said guide means, said cam members being adjustable relative to each other independently of their rotational motion;

means for rotating the guide means relative to the drum at least during phases when the drum is not being rotated, said means comprising at least two concentrically bearingly supported shafts respectively associated with said cam members;

adjustment means for adjusting the starting rotational position of the guide means; and

adjustment means for adjusting rotational positions of said shafts relative to each other.

5,486,049

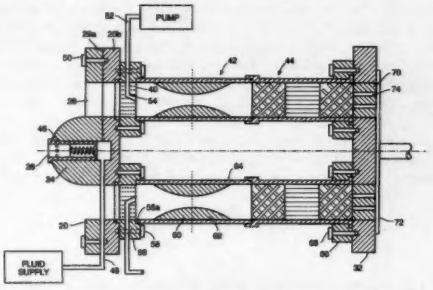
APPARATI FOR MIXING FLUID SUBSTANCES

Jack K. Boatman; John T. Farnsworth; Roger D. Johnson, all of St. Joseph, Mo., and Linda A. Young, Roxbury, Conn., assignors to Nestec S.A., Vevey, Switzerland

Filed Jan. 28, 1994, Ser. No. 188,437

Int. Cl.[6] B01F *5/04*

U.S. Cl. 366—175.2 **27 Claims**



18. An apparatus for treating fluid materials comprising:

an extruder for extruding a flow of a fluid substance from an extruder discharge end to obtain an extrudate flow;

an adapter means integrated with the extruder discharge end to converge the extrudate flow to mute lateral flow of the extrudate flow due to effects of screw rotation to obtain a converged extrudate flow;

means positioned for partitioning the converged extrudate flow into a plurality of extrudate flow streams;

conduits connected to the partitioning means and having conduit boundaries for receiving, confining and transporting the partitioned extrudate flow streams so that each conduit receives and the boundary of each conduit confines and transports one extrudate flow stream;

plate means integrated with at least one conduit and having a portion disposed centrally with respect to a cross-section of the conduit boundary and having a plurality of apertures therethrough which are positioned about the centrally disposed portion for segmenting the fluid substance flow transported for forming segmented substance matrix flow containing a network of voids; and

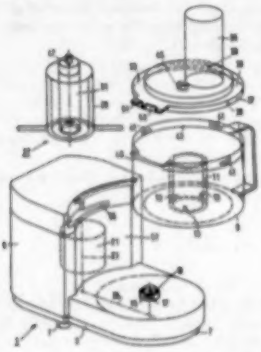
means associated with each plate means for discharging a flow of a fluid additive at a position substantially coincident with the centrally disposed plate means portion for introducing the additive into the segmented substance matrix flow to obtain a combined substance and additive flow.

5,486,050

KITCHEN MACHINE COMPRISING A LID LOCK WITH A CENTRIFUGAL MEMBER

Gerard J. Lenting, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 2, 1994, Ser. No. 284,968
Claims priority, application Belgium, Aug. 4, 1993, 09300811
Int. Cl.[6] B01F *7/16*
U.S. Cl. 366—314 **11 Claims**



1. A kitchen machine with a housing and a bowl which can be placed on the housing and can be closed by means of a lid, while a rotatable tool can be placed in the bowl and driven by means of an electric motor arranged in the housing, the kitchen machine being provided with a locking device for locking the lid during rotation of the tool, characterized in that the locking device is provided with a centrifugal member which is rotatably coupled to a shaft which is drivable by the electric motor and which is movable from a first into a second position under the influence of a rotation of said drivable shaft, and with a safety member which cooperates with the lid and with the centrifugal member, the safety member releasing the lid in the first position of the centrifugal member and locking the lid in the second position of the centrifugal member.

5,486,051

CLOSURE ARRANGEMENT HAVING A BREAKAWAY SEAL

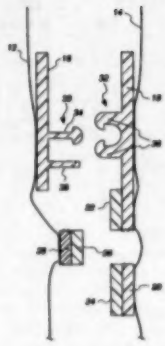
Timothy J. May, Greenville, Wis., assignor to Reynolds Consumer Products Inc., Appleton, Wis.

Filed Apr. 11, 1994, Ser. No. 225,866
Int. Cl.[6] B65D *33/16*
U.S. Cl. 383—200 **33 Claims**

1. A closure arrangement for a polymeric bag having first and second opposing films, comprising:

first and second generally parallel base strips substantially co-planar with each other and laterally spaced from each other, each of said first and second base strips having an inner and outer surface, said outer. Surface of each of said first and second base strips being adapted for attachment to the first film;

a breakaway strip disposed generally parallel to and substantially co-planar with said first and second base strips said breakaway strip having opposing inner and outer surfaces and opposing upper and lower sides extending between Said inner and outer surfaces, said breakaway strip disposed between said spaced first and second base strips such that said upper side of said breakaway strip is detachably connected to said first base strip to form a first breakaway seal and said lower side of said breakaway strip is detachably connected to said second base strip to form a second breakaway seal, said inner surface of said breakaway strip adapted for attachment to the second film: and



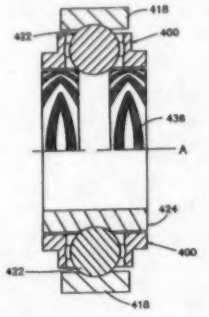
a heat resistant strip attached to said outer surface of said breakaway strip.

5,486,052

SOLID-LUBRICATED BEARING ASSEMBLY

Lewis B. Sibley, Paoli, and C. Brian Kelly, Secane, both of Pa., assignors to Tribology Systems, Inc., Paoli, Pa.

Continuation of Ser. No. 794,152, Nov. 18, 1991, Pat. No. 5,356,227, which is a continuation-in-part of Ser. No. 374,167, Jun. 29, 1989, Pat. No. 5,066,145. This application Oct. 4, 1994, Ser. No. 317,798
Int. Cl.[6] F16C *33/66;33/38*
U.S. Cl. 384—463 **9 Claims**



1. A solid lubricated bearing assembly comprising:

a. a pair of axially aligned mutually facing rotatable bearing members comprising:

i. radially mutually facing bearing surfaces; and

ii. radially mutually facing annular surfaces substantially adjoining said bearing surfaces;

b. rotatable bearing elements retained between and in facing rotatable contact with said mutually facing bearing surfaces;

c. at least one of said facing annular surfaces being etched sufficiently to generate circumferential air currents resisting axial travel of solid lubricant material in said bearing assembly during relative rotation of said members respecting one another.

5,486,053

BEARING UNIT FOR A VEHICLE WHEEL

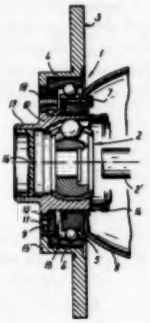
Thomas Beagley, La Membrolle Sur Choisille, France; Hendrikus J. Kapaan, Nieuwegein; Leslie Berryman, Vianen, both of, Netherlands, and Olivier Message, Tours, France, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Filed Mar. 17, 1993, Ser. No. 32,809

Claims priority, application Netherlands, Mar. 19, 1992, 9200511

Int. Cl.[6] F16C *33/64*; B60K *17/30*

U.S. Cl. 384—513 29 Claims



1. Bearing unit for a vehicle wheel, comprising a three-point or four-point bearing with an inner and an outer race, each with a single bearing groove containing a single series of rolling elements, which inner race has means for fixing to the suspension construction for the wheel, characterised in that at least the outer race has a radially inward pointing bearing flange, which outer race bearing flange is provided with fixing means for fixing a wheel or drive means or brake means thereto.

5,486,054

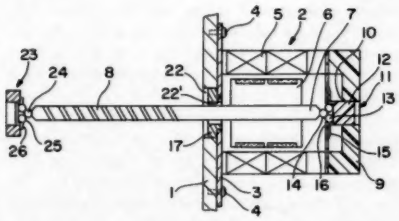
BEARING SYSTEM IN A MOTOR FOR A FLOPPY DISK DRIVE APPARATUS

Toshihiko Nagata, Ogasa; Hiroshi Sano, Iwata; Takayuki Yamawaki, Kakegawa, and Kunitake Matsushita, Toyohashi, all of, Japan, assignors to Minebea Co., Ltd., Kitasaku, Japan

Filed Sep. 12, 1994, Ser. No. 304,545

Int. Cl.[6] F16C *19/10*

U.S. Cl. 384—610 3 Claims



1. A bearing system in a motor for a floppy disk drive apparatus in which a rotary shaft, having a rotor fixedly mounted thereto, extends to an outside portion of the motor to act as a leadscrew, the bearing system comprising:

a protective cap mounted to one side of the motor;

a first pivot bearing arranged movable to and from the protective cap in an axial direction of the rotary shaft;

a second pivot bearing mounted to a base for installation of the motor;

a plate to which the motor is secured;

a thrust spring to urge the first pivot bearing in the axial direction of the rotary shaft;

the rotary shaft being rotatably supported at one end by the first pivot bearing and at the other end by the second pivot bearing; and

an alignment bushing arranged through which the rotary shaft of the motor extends without direct contact and closely fitted into a positioning hole provided in the plate to which the motor is secured.

5,486,055

OUTPUT METHOD AND APPARATUS

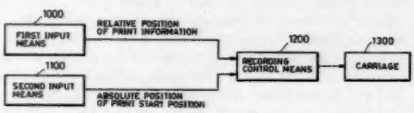
Hirotsugu Oka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 685,640, Apr. 16, 1991, abandoned. This application Apr. 5, 1994, Ser. No. 223,126

Claims priority, application Japan, Apr. 20, 1990, 2-105622

Int. Cl.[6] B41J *5/00*

U.S. Cl. 400—61 24 Claims



1. An apparatus for controlling a printer to output a plurality of documents on a display of labels, comprising:

first input means for inputting the absolute position of a predetermined fixed standard position for printing a plurality of labels after setting a label sheet having the plurality of labels in the printer;

second input means for inputting the size of a label and the position of the next label to determine the relative position of print information to be printed on the plurality of labels with respect to the absolute position of the fixed standard position;

first guide means for controlling the position of the printer for outputting a document for a first label on the basis of the absolute position input by said first input means; and

second guide means for controlling the position of the printer for outputting a document for a second label on the basis of the relative position input by said second input means.

5,486,056

ADJUSTABLE, LOCKABLE DAMPER

Richard P. Thorn, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Jun. 30, 1993, Ser. No. 85,853

Int. Cl.[6] A47C *1/024*

U.S. Cl. 403—322 20 Claims

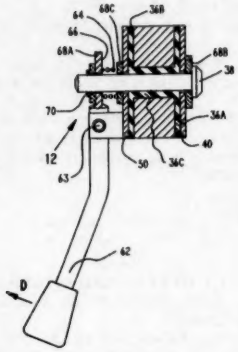
1. An adjustable, lockable damping device for damping motion between a first member relative to a second member, comprising:

(a) a first relatively thin flat plate having inwardly and outwardly facing planar surfaces and attachment means for attaching to one of said first and said second members;

(b) a second relatively thin flat plate having inwardly and outwardly facing planar surfaces and attachment means for attaching to one of said first and said second members, said second plate being attached to the same one of said first and said second members as said first plate;

(c) a center plate having two opposed outwardly facing planar surfaces and attachment means for attaching to a remaining one of said first and said second members;

(d) a first elastomer element sandwiched between the inwardly facing planar surface of said first plate and an outwardly facing planar surface of said center plate;



(e) a second elastomer element sandwiched between the inwardly facing planar surface of the second plate and another outwardly facing planar surface of said center plate;

(f) user-operable clamping means compressing said outwardly facing planar surfaces of said first and said second plates against said elastomer elements with a first compression force in a first non-user-engaged position, lever means for moving said user-operable clamping means to a second position substantially reducing said first compression force, such that said first and second members can be selectively locked relative to said center plate to restrain relative movement between said first and said second members; and

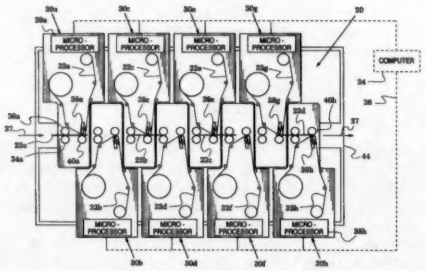
(g) surface effect damper means provided for maintaining damping between said first and said second members even when said clamping means is in said second position, such that rotational motion of said first member is damped relative to said second member whereby said first and said second members move relative to each other at a controlled rate.

5,486,057

MULTICOLOR PRINTER SYSTEM HAVING MULTIPLE PRINT HEADS

Donald K. Skinner, West Hills; Yoshi Yagi, North Hill, and Wilfried Zogg, La Crescenta, all of Calif., assignors to Eltron International, Inc., Simi Valley, Calif.

Continuation of Ser. No. 879,034, May 6, 1992, abandoned.
This application May 10, 1994, Ser. No. 240,260
Int. Cl.[6] B41J *2/32*
U.S. Cl. 400—120.02 **14 Claims**



1. A system for successively transporting discrete cards, each card having a predetermined length, along a card path from an upstream entrance to a downstream exit, and for printing on both faces of each card as it is being transported along said path, said system comprising:

a plurality of substantially identical printer modules arranged in succession along a path, each of said printer modules including;

(a) print means including a transfer ribbon for printing one of a plurality of colors on a face of a card transported therepast; and

(b) drive means for incrementally transporting each card along a portion of said path, past said print means, to the drive means of a succeeding printer module;

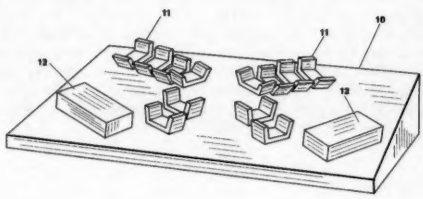
said plurality of printer modules arranged in succession along said path alternately comprising a printer module from a first set having its print means mounted adjacent a first side of said path to print on a first face of each card transported therepast, and a printer module from a second set having its print means mounted adjacent a second side of said path to print on a second face of each card transported therepast, successive ones of said printer modules being closely positioned so that the respective drive means thereof are spaced by a distance less than said predetermined card length.

5,486,058

CONTINUOUS TOUCH KEYBOARD

Donald E. Allen, 1012 W. Eskridge Ave., Stillwater, Okla. 74075

Filed Aug. 9, 1994, Ser. No. 287,785
Int. Cl.[6] B41J *5/10;5/28*
U.S. Cl. 400—485 **2 Claims**



1. A keyboard for in-putting data into an information processing device, and which keyboard may be operated by the operator without removing the hands from the keyboard, comprising:

a keyboard base or enclosure;

a plurality of four position actuators mounted on said keyboard base or enclosure arranged conformably to the natural position of both right and left hands of an operator;

each of said actuators comprising a truncated vee cap, and a stem terminating in a shutter, shaped to permit selective blocking of light impulses to either the inner or the outer of two transversely mounted optic fibers or of both fibers, by inward, outward or downward movement of the actuator cap by the respective fingers;

two of said actuators being mounted on said keyboard conformably under the right and left palms of the operator, the said actuator caps being covered by palm rests with means to activate said actuators by motion of the palms;

means for assigning letters, numerals, symbols and functions to each of said positions of said actuators;

means for sensing each of the four positions of each of said actuators; and

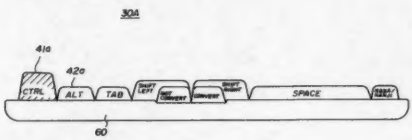
where said ten base actuators are arranged on said keyboard in three dimensions to conform to the arc of fingertips and to their differences in length between the thumb and the other four fingers in a cupped pendant hand, and the actuators for fingers **2**, **4**, and **5** and the thumb are elevated above the other actuators.

5,486,059

KEYBOARD HAVING IMPROVED KEYTOP

Selichi Iwasa; Hideyuki Motoyama, and Makoto Yoshioka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 23, 1993, Ser. No. 21,227
Claims priority, application Japan, Feb. 27, 1992, 4-041582
Int. Cl.[6] B41J *5/08*
U.S. Cl. 400—488 **34 Claims**



1. A keyboard comprising:
a keyboard body;
a plurality of keys arranged in rows and columns; and
switching means, coupled to the keys, for turning switching elements ON and OFF in response to operations on the plurality of keys,
a special key among the plurality of keys having a keytop which is at least a stroke length of the special key higher than keytops of keys arranged in a row in which the special key is located.

5,486,060

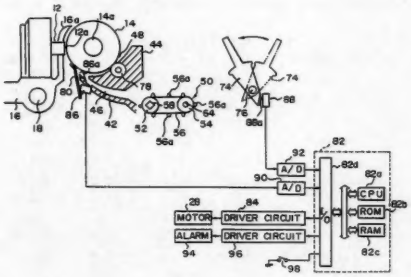
Patent Not Issued For This Number

5,486,061

PAPER FEEDING METHOD AND APPARATUS FOR PREVENTING THE DOUBLE FEEDING OF PAPERS

Kazuhiro Kakuguchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 572,273, Aug. 24, 1990, abandoned. This application Jan. 7, 1994, Ser. No. 178,629
Claims priority, application Japan, Aug. 25, 1989, 1-219135
Int. Cl.[6] B41J *11/00*
U.S. Cl. 400—605 **27 Claims**



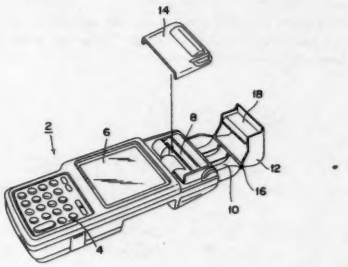
1. A paper feeding apparatus for selectively feeding at least first and second papers to a paper-processing station through at least a first and second paper guide path, comprising:
first feeder means for selectively feeding the first paper through said first paper guide path to said paper-processing station;
second feeder means for feeding the second paper through said second paper guide path to said paper-processing station;
selecting means for selecting one of said first feeder means and said second feeder means;
monitor means for monitoring a paper fed by said first and second feeder means to said paper-processing station through said first and second paper guide paths and includes means for generating, in the event of a double feeding of both papers, a signal indicating an occurrence of the double feeding of the papers, wherein said monitor means also monitors whether said first feeder means is selected to feed the first paper through said first paper guide path to said paper-processing station; and
alarm means for receiving said signal from said monitor means and warning of the occurrence of the double feeding of the papers on the basis of the signal generated by said monitor means.

5,486,062

PRINTER-CONTAINING APPARATUS

Shinichiro Tsurumaru, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 17, 1994, Ser. No. 291,860
Claims priority, application Japan, Jan. 29, 1993, 5-271487
Int. Cl.[6] B41J *15/16*
U.S. Cl. 400—618 **4 Claims**



1. An apparatus in which a printer in which roll paper is used as a printing paper is contained, comprising:
a roll paper accommodation section for receiving roll paper having a leading end having a rib for reducing the friction between said roll paper accommodation section and the roll paper;
a printer housing having a roll paper introduction portion opened therein for introducing the leading end of the roll paper into said printer therethrough;
a cover pivotally mounted for opening and closing movement on said roll paper accommodation section, said cover having a rib for reducing the friction between said cover and the roll paper; and
a guide provided integrally on said cover for limiting the width of the passage of the leading end of the roll paper at said roll paper introduction portion.

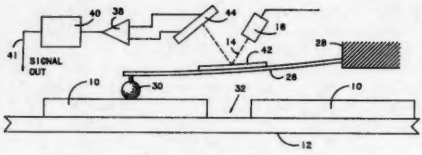
5,486,063

METHOD AND APPARATUS FOR SENSING THE LENGTH OF LABEL OR TAG MEDIA BY DETECTING CHANGES IN RELATIVE THICKNESS

Duane M. Fox, Snohomish, and Joel A. Schoen, Woodinville, both of Wash., assignors to Intermec Incorporated, Everett, Wash.

Filed Jan. 9, 1995, Ser. No. 370,089
Int. Cl.[6] G01N *21/86*
U.S. Cl. 400—708 **8 Claims**

1. Sensing apparatus for determining edge-indicating changes in thickness of a moving web from a fixed surface over which the web is moving comprising:
a) a sensor disposed above the fixed surface measuring the distance to a surface passing beneath it and outputting a first signal reflecting said distance;



b) an amplifier amplifying said first signal to a usable level second signal; and,

c) a detector sensing changes in said second signal beyond a pre-established threshold amount and outputting a third signal indicating an edge has been found; wherein said sensor comprises:

d) a beam fixedly carried above the fixed surface on one end and having a free end in contact with the web, said beam being self-biased to have said free end contact the web for all thicknesses thereof whereby said beam flexes in response to changes in thickness of the web;

e) a mirror carried by said beam to flex therewith;

f) a light source directing a light beam onto said mirror to be reflected thereby; and,

g) a light sensor having a sensing surface positioned to have said light beam reflected by said sensing surface thereof in at least one position of said free end, said light sensor having a signal output being said first signal.

5,486,064

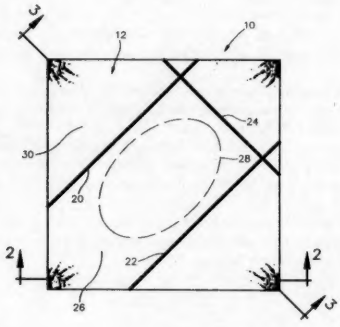
SOAP GRIP FOR BATHING

Eugene L. Schulte, 8301 16½ Mile Rd., Sterling Heights, Mich. 48312

Filed Sep. 15, 1994, Ser. No. 306,682

Int. Cl.[6] A47K *7/03*

U.S. Cl. 401—201 **4 Claims**



1. A reusable soap holder and grip for use in sudsing and lathering by a user while bathing, said holder being comprised of separate integral first and second panels of cloth positioned in overlying relation, a seam connecting the panels together in a generally U-shaped seam to provide a pocket closely receiving a bar of soap, said first and second panels extending outwardly around said seam to form disconnected and separate flaps extending from each of said panels, said flaps being completely free on exterior edges, said panels having a porous quality to promote sudsing and lathering from the bar of soap inside the pocket when wetted, the cloth being comprised of stretchable non-woven polyester felt, the seam being formed by a heat seal of the polyester felt and said pocket being stretchable to receive various sizes of bars of soap.

5,486,065

TRAFFIC SPEED CONTROL UNIT AND ASSEMBLY

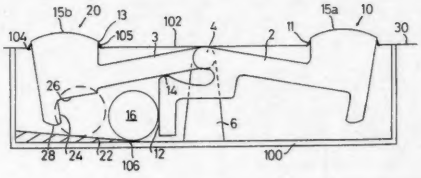
Richard M. James, 30 Holly Lane, Erdington, Birmingham, England

Filed Dec. 1, 1994, Ser. No. 343,583

Claims priority, application United Kingdom, Jun. 3, 1992, 9211749

Int. Cl.[6] E01F *9/047*

U.S. Cl. 404—15 **13 Claims**



12. A traffic speed control unit for mounting in a housing recessed in a traffic surface to provide a jolt to a wheel of a vehicle travelling on the traffic surface faster than a predetermined threshold speed, comprising:

a first support surface and a second support surface mounted in the housing, said first support surface being positioned so as to be moved by contact with the wheel of the vehicle and said second support surface being positionable in an abutment position proud of the road surface for disrupting smooth travel of the wheel of the vehicle; and

mechanical control means adapted to be removably positioned by said first support surface into weight transmitting relation with said second support surface long enough to provide a jolt to a wheel of a vehicle travelling faster than the threshold speed, but not long enough to provide a jolt to a wheel of a vehicle travelling slower than the threshold speed.

5,486,066

PAVING STONE SET AND PROCESS AND DEVICE FOR THE MANUFACTURE THEREOF

Gerhard Hagenah, Worpswede, Germany, assignor to SF-Kooperation GmbH Beton Konzepte, Bremen, Germany

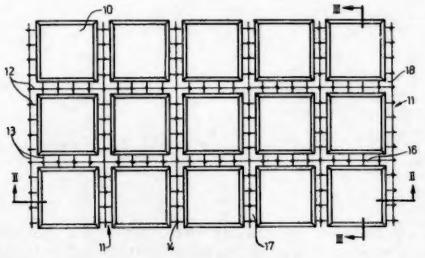
PCT No. PCT/EP92/02670, § 371 Date May 19, 1994, § 102(e) Date May 19, 1994, PCT Pub. No. WO93/10310, PCT Pub. Date May 27, 1993

PCT Filed Nov. 20, 1992, Ser. No. 244,103

Claims priority, application Germany, Nov. 23, 1991, 41 38 564.0

Int. Cl.[6] E01C *11/16*

U.S. Cl. 404—45 **9 Claims**



1. A device for the manufacture of paving stone sets comprising concrete paving stones which are spaced apart and are joined together by a holding grid,

said device comprising a concrete mold having a flask defining die cavities for respective concrete paving stones, which flask rests on a molding plate, wherein

a) the flask is divided along a horizontal partition plane extending at a distance from a lower limit of the die cavities and running approximately parallel to the molding plate,

b) the flask comprises a top part-flask, fixed against horizontal movement, and a bottom part-flask which is horizontally movable relative to said top part-flask,

c) the bottom part-flask comprises only transverse mold walls extending in the direction of a drawing motion of the bottom part-flask, and

d) means for drawing off the bottom part-flask from the molding plate, relative to the fixed top part-flask, in the horizontal direction.

5,486,067

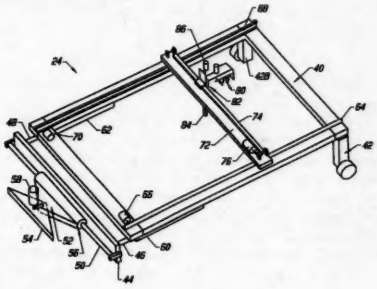
APPARATUS AND METHOD FOR MARKING A SURFACE

Duc Huynh, Fremont; Daniel D. Sieben, Menlo Park, and Donald W. Nusbaum, Woodside, all of Calif., assignors to Pavement Marking Technologies, Inc., Menlo Park, Calif.

Filed Dec. 14, 1993, Ser. No. 167,662

Int. Cl.[6] E01C *23/16;* **E01F** *9/04*

U.S. Cl. 404—84.05 **48 Claims**



32. In an apparatus for marking a surface, the combination comprising:

a surface marking mechanism supporting a material dispenser, said surface marking mechanism including

means for securing said surface marking mechanism to a transport vehicle,

means for manipulating said material dispenser relative to a plane substantially parallel to said surface,

means for moving said material dispenser along a z-axis generally orthogonal to said surface, and

means for rotating said material dispenser around a w-axis substantially normal to said surface; and

a controller which generates control signals, which are conveyed to said surface marking mechanism, to cause said surface marking mechanism to generate a predetermined pattern on said surface, said predetermined pattern being selected from a pattern library stored in a memory device of said controller, which pattern library includes a plurality of patterns, each of which has a corresponding set of execution instructions that result in said control signals.

5,486,068

PROCESS FOR TREATING WASTE MATERIALS WITH CONCENTRATED ACID AND THE PRODUCT PRODUCED THEREBY

Harold W. Wilson, El Paso, Tex., assignor to Soil and Water Management, Inc., Chicago, Ill.

Filed Nov. 3, 1993, Ser. No. 145,218

Int. Cl.[6] B09B *3/00;* **C05F** *11/00*

U.S. Cl. 405—129 **33 Claims**

1. A process for treating lignocellulose or cellulose containing materials comprising applying a concentrated acid selected from the group consisting of concentrated sulfuric acid, concentrated phosphoric acid and mixtures thereof in a constant stream to said materials to thoroughly admix said concentrated acid and said materials, and drying the resultant mixture at a temperature between about 225° and 300° F.

25. A product for treating agricultural soil or for use as a landfill material prepared by the process of applying a concentrated acid selected from the group consisting of concentrated sulfuric acid, concentrated phosphoric acid and mixtures thereof in a constant stream to lignocellulose or cellulose containing materials to thoroughly admix said concentrated acid and said materials, and drying the resultant mixture at a temperature between about 225° and 300° F.

5,486,069

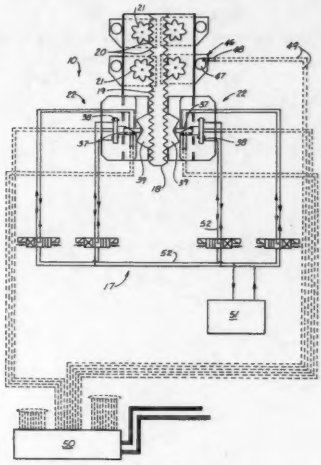
OFFSHORE JACK-UP RIG LOCKING SYSTEM

John Breeden, 810 N. Beach Blvd., Bay St. Louis, Miss. 39520

Filed Jun. 6, 1994, Ser. No. 254,121

Int. Cl.[6] E02B *17/00;17/06*

U.S. Cl. 405—198 **23 Claims**



1. A fixation system for fixing the leg of a mobile jack up drilling platform with the hull of the platform comprising:

a) a hull having a plurality of at least three legs, each movable into different elevational positions relative to the hull so that the hull can be elevated upon the legs;

b) jacking towers that enable the legs to be elevated and lowered and the hull to be elevated on the legs when the legs have engaged the underlying seabed;

c) each of the legs having a longitudinal axis and a toothed rack that extends longitudinally along the leg;

d) each of the jacking towers including means supported upon the hull adjacent each of the legs for engaging the toothed rack;

e) upper, middle and lower actuators associated with each leg jacking tower positioned to travel between retracted and extended positions, each of the actuators having a first end portion that is connected to the jack tower and a second end portion including bearing surfaces thereon, wherein the extended position places the bearing surfaces adjacent the toothed rack;

f) a chock member attached to the middle actuator, with a plurality of teeth thereon that correspond in shape and spacing to the teeth of the toothed rack of the leg, wherein the extended position places the chock member adjacent the toothed rack;

g) the chock member having upper and lower bearing surfaces that correspond to the upper and lower actuator bearing surfaces respectively;

h) wherein each leg can be fixed relative to the hull when the upper and lower actuators travel to the extended position and engage the bearing surfaces of the chock; and

i) means for remotely and automatically aligning the chock teeth and leg teeth without requiring a human visual confirmation of alignment.

5,486,070

METHOD FOR CONDUCTING OFFSHORE WELL OPERATIONS

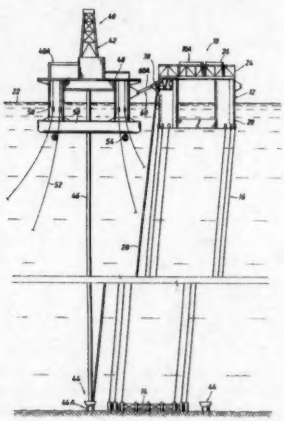
David A. Huete, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 35,847, Mar. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 919,630, Jul. 24, 1992, Pat. No. 5,199,821, which is a continuation of Ser. No. 624,866, Dec. 10, 1990, abandoned. This application Sep. 30, 1994, Ser. No. 316,200

The portion of the term of this patent subsequent to Apr. 6, 2010, has been disclaimed.

Int. Cl.[6] E02B *17/00*

U.S. Cl. 405—202 **12 Claims**



1. A method for conducting offshore well operations, comprising:

installing a compliant platform having a normal position in substantially vertical alignment with a well site;

positioning the offshore drilling vessel over a selected well site, comprising:

biasing the compliant platform out of substantially vertical alignment with the well site and securing this position with respect to the ocean floor; and substantially vertically aligning a drilling derrick of the offshore drilling vessel over the well site and securing this position with respect to the ocean floor and the well site situated thereon for well operations while continuing to restrain the relative position of the offshore drilling vessel with respect to the compliant platform by their respective positions as defined in relation to the ocean floor; and

conducting well operations from the offshore drilling vessel through a riser.

5,486,071

METHOD AND APPARATUS FOR SUPPORTING A LOAD

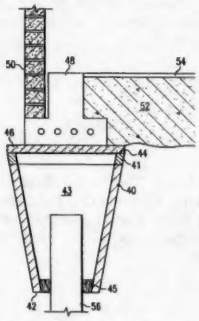
Roger A. Bullivant, Burton-on-Trent, England, assignor to Roger Bullivant of Texas, Inc., Grand Prairie, Tex.

Filed Feb. 17, 1993, Ser. No. 19,120

Claims priority, application United Kingdom, Feb. 19, 1992, 9203481; Apr. 11, 1992, 9208059

Int. Cl.[6] E02D *5/60;7/02*

U.S. Cl. 405—229 **12 Claims**



1. A load bearing assembly for supporting a structure on the ground, said assembly comprising:

an axially extending preformed pile member adapted to be located at least generally vertically in the ground;

a separate preformed load bearing pile head adapted to be supported on the upper end portion of said pile member, with the transverse dimensions of said pile head being substantially greater than the corresponding transverse dimensions of said pile member;

wherein said pile member is located at least substantially vertically in the ground with the upper end portion of said pile member being surrounded by a recess in the ground, said recess being filled with particulate material up to at least the level of said pile head, said recess having an at least generally frustoconical configuration with the top of said recess being larger than the bottom of said recess;

wherein the transverse cross section of the upper end portion of said pile member perpendicular to the longitudinal axis of the pile member is smaller than the transverse cross section of the portion of said pile member immediately below said upper end portion perpendicular to the longitudinal axis of said pile member so as to form an upwardly facing shoulder; and

wherein said pile head has an opening therethrough with the dimensions of said opening being larger than the corresponding dimensions of said upper end portion of said pile member and smaller than the corresponding dimensions of the portion of said pile member immediately below said upper end portion, the pile head being fitted over said upper end portion of said pile member and supported on said shoulder and said pile head being bonded to said pile member.

5,486,072

CUTTING TOOLS OF COMPOSITE CONSTRUCTION

Geoffrey C. Green, Bristol, Great Britain, assignor to British Aerospace PLC, Farnborough, England

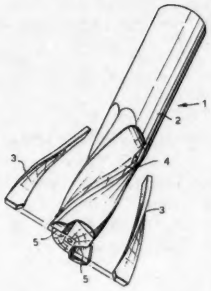
Filed Aug. 6, 1993, Ser. No. 102,901

Claims priority, application United Kingdom, Aug. 6, 1992, 9216699

Int. Cl.[6] B23C *5/10*

U.S. Cl. 407—32 **3 Claims**

1. A composite cutting tool constructed and arranged to be rotated to cut a workpiece, the cutting tool comprising a body of tungsten carbide material and having at least one flute in a periph-



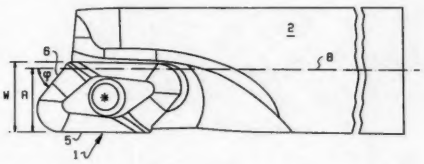
ery thereof and extending therealong defining a tooth, and a strip of tungsten carbide material attached to the tooth and ground to form a cutting blade.

5,486,073

CUTTING INSERT FOR A MILLING CUTTER TOOL

Amir Satran, Kfar Havradim, and Rafael Margulis, Karmiel, both of, Israel, assignors to ISCAR Ltd., Migdal, Israel

Filed Jul. 12, 1993, Ser. No. 90,839
Claims priority, application Israel, Sep. 1, 1992, 103008
Int. Cl.[6] B23C *5/02*
U.S. Cl. 407—113 **9 Claims**



1. A cutting insert for a rotary routing cutter tool, said insert being of substantially parallelopipedal shape and having a first pair of elongated cutting edges substantially parallel to a rotary axis of the insert, each cutting edge of said first pair being defined between contiguous rake and relief surfaces of said insert; a second pair of cutting edges transversely directed with respect to said first pair, each cutting edge of said second pair comprising first and second successive cutting edge portions, said first cutting edge portion merging with an adjacent cutting edge of said first pair via a rounded insert corner, the adjacent cutting edges defining at said corner a substantially acute angle; said second cutting edge portion sloping towards a base of said insert so as substantially to intersect said rotary axis and so as to merge with an adjacent cutting edge of said first pair via a coupling portion which slopes away from said insert base wherein said first cutting edge portion slopes toward said insert base.

5,486,074

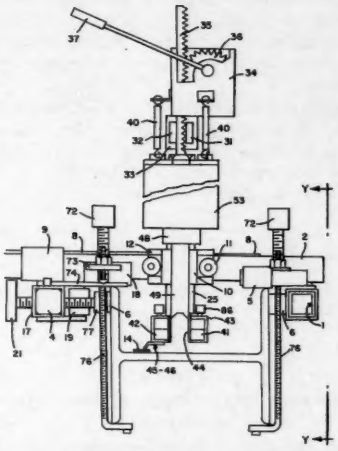
PORTABLE DRILLING APPARATUS

John M. Jordan, 104A Overlook Pass, Clifton Park, N.Y. 12065

Filed Sep. 15, 1994, Ser. No. 306,393
Int. Cl.[6] B23B *45/14;41/00*
U.S. Cl. 408—77 **6 Claims**

1. A portable apparatus for drilling holes in a workpiece, comprising:

a first frame member comprising a substantially rectangular frame comprising a first elongated element, a second elongated element attached at a first end of said first element at a substantially right angle thereto, a third elongated element attached at a second end of said first element at a substantially right angle thereto so that said second and third elements are



parallel to each other, and a fourth elongated element slidably mounted on said second element and said third element so that said fourth element is parallel to said first element;

a second frame member slidably attached to and substantially perpendicular to said first frame member;

a plurality of rollers attached to said first frame member and positioned so that said first frame member is movably supported on the workpiece;

a first clamping device to secure said first frame member to the workpiece at a desired location;

a second clamping device to secure said second frame member to said first frame member at a desired location; and

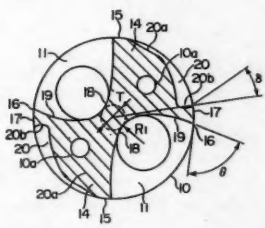
a drill mounted on said second frame member.

5,486,075

BORING TOOL

Shinichi Nakamura, and Takashi Kubota, both of Gifu, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Jul. 27, 1994, Ser. No. 280,876
Claims priority, application Japan, Jul. 27, 1993, 5-185314; Jul. 27, 1993, 5-185315
Int. Cl.[6] B23B *51/02*
U.S. Cl. 408—230 **19 Claims**



1. A boring tool, comprising:

a tool body rotatable about an axis in a tool rotation direction;

a pair of chip discharge flutes formed in the outer peripheral surface of said tool body;

cutting edges formed on edge lines where the wall surfaces of said flutes facing forwardly in the tool rotation direction intersect end relief surfaces of said tool body;

a pair of lands formed on the trailing sides of the respective chip discharge flutes from the direction of tool rotation;

first margins formed on ends of the respective lands adjacent to the respective chip discharge flutes;

second margins formed on ends of the respective lands adjacent to heels thereof;

said first and second margins being arranged substantially at a constant spacing in the circumferential direction of said tool body; and

recesses formed in the respective lands with the depth of each recess progressively increasing from the first margin towards the second margin of the associated land, said recesses including convex curved surface portion (**20***a*) and a concave curved surface portion (**20***b*).

5,486,076

RADIUS-MILLING FIXTURE FOR MACHINING WORKPIECES

Bernhard Hauschopp, Franz-Simon-Strasse 19, D-65934 Frankfurt (Main), Germany

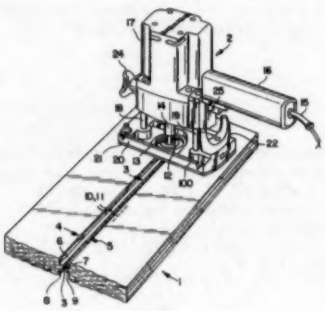
PCT No. PCT/DE93/00087, § 371 Date Aug. 10, 1994, § 102(e) Date Aug. 10, 1994, PCT Pub. No. WO93/15873, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 3, 1993, Ser. No. 290,795

Claims priority, application Germany, Feb. 8, 1992, 42 03 721.2

Int. Cl.[6] **B23C** *1/20*; **B27C** *5/10*

U.S. Cl. 409—179 **13 Claims**



1. Radius-milling fixture for machining of workpieces by means of a manual surface milling cutter, with

a plate (**1**),

which has a slot (**3**),

a fastening device (**30–35**), which can be guided in the slot (**3**) and connected to the workpiece (**40**) being machined,

an upper guide groove (**6, 7**) provided in the upper region of the slot (**3**),

a bottom plate (**20, 21**) for the manual surface milling cutter, characterized in that;

the plate (**1**) serves as a bearing surface for the bottom plate (**20, 21**) of the manual surface milling cutter,

a lower guide groove is provided in the lower region of the slot (**3**),

a borehole is provided in the plate (**1**), through which the milling head of the manual surface milling cutter can be guided,

the slot (**3**) with the upper and lower guide grooves (**6, 7, 8, 9**) terminates in the borehole (**12**), and

the fastening device (**30–35**) has a projection (**33, 34**) that projects past the bottom side of the plate (**1**).

5,486,077

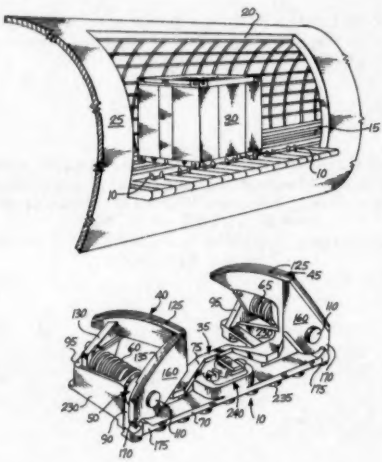
CARGO HANDLING SYSTEM ROLLOUT STOP ASSEMBLY

Harold E. Nutting, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 17, 1994, Ser. No. 340,777

Int. Cl.[6] **B60P** *7/135*

U.S. Cl. 410—69 **12 Claims**



1. A rollout stop assembly allowing a movable object to pass over it in one direction but obstructing passage in the opposite direction, said assembly comprising:

(a) a frame;

(b) an arm assembly rotatably mounted in said frame, said arm assembly normally extending in an upright position into the path of the movement of said object and capable of slight movement in said one direction;

(c) said arm assembly having a camming surface engagable with said object when it is moving in said one direction, said camming surface being configured to cause said arm assembly to translate in said one direction and to rotate in a downward direction and out of the path of said object upon engagement therewith, said arm assembly rotating about an axis lying substantially parallel to the direction of movement of said object;

(d) a dog clutch assembly releasably connecting said arm assembly to said frame and normally preventing said arm assembly from rotating, said dog clutch assembly disengaging said arm; assembly from said frame when said object engages said arm assembly camming surface whereby when said object engages said camming surface, said arm assembly translates in said one direction and rotates in said downward direction;

(e) means for rotating said arm assembly back into the path of the object after the object has passed beyond said arm assembly, and

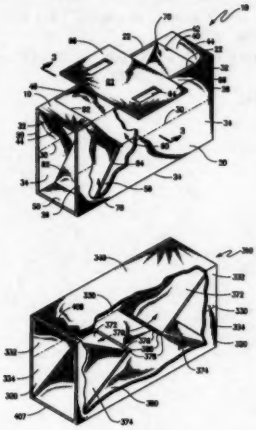
(f) said arm assembly having an abutment surface for engaging said object after said arm assembly has been rotated back to its normal upright position to prevent movement of said object in said opposite direction.

5,486,078

REUSABLE VOID FILLER AND CONSTRUCTION METHOD THEREFORE

Frederick M. Wise, Arvada, and Carl F. DeWitt, Westminster, both of Colo., assignors to Capitol Packaging Corporation, Denver, Colo.

Filed Apr. 23, 1993, Ser. No. 52,563
Int. Cl.[6] B61D *45/00*; B63B *25/24*
U.S. Cl. 410—155 **21 Claims**



1. A void filling device collapsible into a flattened state and expandable into an erect state and adapted to be interposed between spaced cargo when in the erect state to inhibit relative movement during transit, comprising:

(a) a pair of side panels each having longitudinally extending first and second side edges, said pair of side panels being spaced apart from one another to define an interior therebetween when said void-filling device is in the erect state, each of said side panels including side panel portions constructed to fold about a longitudinal axis between a folded state when said void-filling device is collapsed and an unfolded state when said void-filling device is erect;

(b) a first base panel hingedly secured to the first side edges of said side panels to extend transversely therebetween and a second base panel hingedly secured to the second side edges of said side panels to extend transversely therebetween such that said first and second base panels move toward one another when said side panels are folded into the folded state and move away from one another when said side panels are unfolded into the unfolded state whereby said first and second base panels are closely spaced with one another when said void-filling device is collapsed and spaced-apart from one another when said void-filling device is erect; and

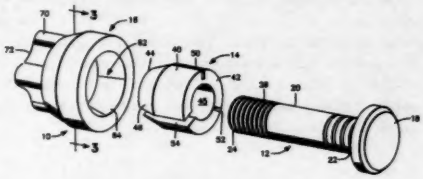
(c) a foldable beam structure located in the interior between said side panels and oriented transversely thereto, said beam structure hingedly connected to said first and second base panels to extend therebetween, said beam structure including first and second beam panels foldable with respect to one another about a transverse axis so that, as said first and second base panels move toward and away from one another, said first and second beam panels fold to allow said void-filling device to collapse and expand, said beam structure operative when said void-filling device is in the erect state to support said side panels against transverse compression forces, said void filling device being integrally formed as a single-piece construction.

5,486,079

BREAKABLE BOLT ASSEMBLY

Dennis C. Martin, Gold Hill, and Mark A. Reeb, Grants Pass, both of Oreg., assignors to Advanced Parts Technology, Inc., Grants Pass, Oreg.

Filed Jul. 5, 1994, Ser. No. 270,439
Int. Cl.[6] F16B *19/00*; *35/00*
U.S. Cl. 411—392 **19 Claims**



1. A break-apart bolt assembly comprising:

a pin member comprising an elongated pin body and a pin head, said pin body having a proximal end and a distal end, said proximal end of said pin body having a plurality of flutes transverse to the length of said pin body and spaced from each other, said pin body having external threads along a length portion at said distal end thereof;

a collet member body having proximal and distal ends, said collet member body having an internal passage for receiving said distal end of said pin body and being compressible around the pin body and said distal end having a length portion which is tapered inward for a predetermined length of said collet member body;

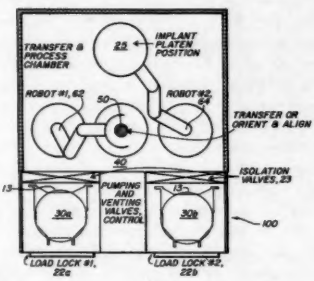
threaded abutment member having an internal passage for receiving said distal end of the collet member body, said internal passage having a mouth which opens to a first length portion which is tapered inward from said mouth, and a second length portion having internal threads which mate with said external threads of said pin body of said pin member, said first length portion engaging said tapered length portion of said collet member body to lock onto said collet member body and pin body.

5,486,080

HIGH SPEED MOVEMENT OF WORKPIECES IN VACUUM PROCESSING

Manny Sieradzki, Gloucester, Mass., assignor to Diamond Semiconductor Group, Inc., Glouster, Mass.

Filed Jun. 30, 1994, Ser. No. 269,159
Int. Cl.[6] B65G *1/04*
U.S. Cl. 414—217 **20 Claims**



1. Apparatus for processing semiconductor wafers from cassettes in vacuum, said apparatus comprising

a vacuum chamber maintained at high vacuum and containing a first robot, a second robot and a wafer transfer station for transferring a wafer from one robot to the other robot,

a first load lock and a second load lock through each of which a cassette of wafers can be loaded and unloaded from atmospheric pressure to be selectively introduced in said vacuum chamber,

pumping and venting means for pumping down and for venting each of said load locks,

a process station at said vacuum chamber for receiving wafers from and providing wafers to both the first and the second robot, and

control means for controlling said first and second robots to successively and continuously move wafers from one load lock to the process station and back via the transfer station while operating said pumping and venting means to pump down or vent the other load lock.

5,486,081

DEVICE FOR FEEDING REELS ON TO A USER MACHINE

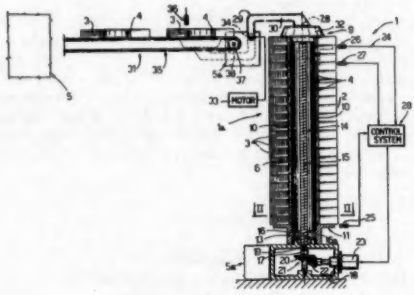
Fiorenzo Draghetti, Medicina, Italy, assignor to G.D Societa' Per Azioni, Bologna, Italy

Filed May 24, 1993, Ser. No. 66,722

Claims priority, application Italy, May 26, 1992, BO92A0211

Int. Cl.[6] B65H *3/00*

U.S. Cl. 414—225 **7 Claims**



1. A device for feeding reels to a user machine, comprising a vertical lifting device having a top end and designed to receive a stack of said reels; a substantially horizontal feed conveyor for feeding a succession of said reels to said user machine; said feed conveyor having an input end; and transfer means for successively transferring the reels from said top end of the lifting device to an unloading position at said input end of said conveyor; said lifting device comprising means for step feeding the reels to said top end, with the reels laid flat and substantially parallel to a transportation surface defined by said conveyor, said step feeding means comprising a guide and a slide; said guide extending through the slide and having a first substantially vertical axis; said slide being coupled in axially sliding manner to the guide to travel along the first axis, and defining a supporting surface for supporting said stack of reels along a second axis coinciding with said first axis; drive means for moving the slide between first and second limit positions, so as to feed the reels successively towards the top end of the lifting device and means for controlling said drive means; said drive means comprising screw-nut screw transmission means and a motor for driving said transmission means; said transmission means comprising a powered, axially fixed screw mounted for rotation about said first axis, and a nut screw threadably engaged with said powered screw and integral with said slide; said powered screw extending along said aligned first and second axes; said slide comprising an annular plate element, which defines within said plate two openings on opposite sides of said nut screw; said guide being a tubular guide comprising two rods, each engaged in a respective said opening in axially sliding manner with said slide.

5,486,082

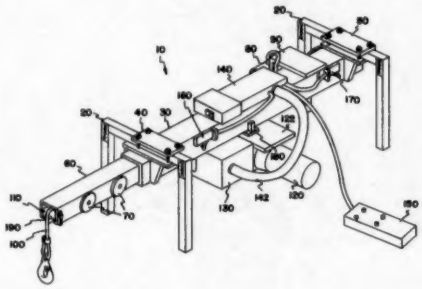
REMOTELY CONTROLLED EXTENDABLE LIFT APPARATUS FOR A VAN

Zeiylik Y. Feldman, 941 No. Sierra Bonita #2, Los Angeles, Calif. 90046, and Yakov Z. Feldman, 7311 Kester Ave., #3, Van Nuys, Calif. 91405

Filed Jul. 7, 1994, Ser. No. 271,198

Int. Cl.[6] B60P *1/54*

U.S. Cl. 414—542 **14 Claims**



1. An extendable lifting apparatus for a vehicle having a frame with a longitudinal axis, a floor, and a body with a door opening along one side, comprising:

support means, secured to and extending from the floor of the vehicle, the support means being disposed within and on opposite sides of the vehicle;

a boom, extendable out the door opening of the vehicle along an axis perpendicular to the axis of the vehicle frame and beyond the exterior of the vehicle, for supporting a cable for lifting heavy objects;

boom receiving means, secured to the support means perpendicular to the axis of the vehicle frame and coupled to the extendable boom, for receiving the extendable boom, the boom receiving means comprising a substantially rectangular tube, the tube having an axial slot extending along the bottom of the tube forming an axial opening, the boom telescoping from a retracted position to an extended position, wherein the boom is wholly received in the tube when the boom is in the retracted position, the slotted wall of the tube forming a floor opposite an inner ceiling;

wherein the boom further comprises a plurality of spaced apart wheels on opposite sides of the boom, the plurality of wheels engaging the floor and the ceiling of the tube to facilitate movement of the boom between the retracted and extended positions and to maintain the position of the boom parallel to the tube;

winch means, coupled to the extendable boom, for successively winding and unwinding the cable for alternately raising and lowering objects;

first drive means, coupled to the receiving means, for moving the boom from a retracted position wholly within the receiving means to an advanced position;

second drive means, coupled to the winch means, for controlling the winding and unwinding of the winch means; and

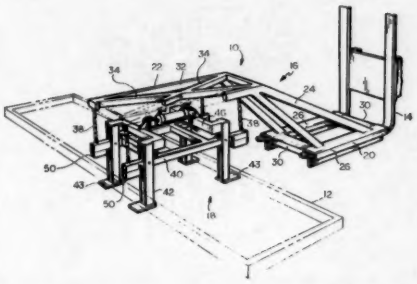
remote control means, electrically coupled to the first and second drive means, for independently activating and arresting the first and second drive means.

5,486,083

PROCESS AND APPARATUS FOR HANDLING A VEHICLE FRAME

Terry L. Thompson, Perrysburg, Ohio, assignor to J Star Consolidated, Stony Ridge, Ohio

Filed Oct. 6, 1994, Ser. No. 319,129
Int. Cl.[6] B66F *9/12*
U.S. Cl. 414—607 **12 Claims**



1. An apparatus for a lift truck for handling a frame of a vehicle, the apparatus comprising:

a support frame operatively connected to and cantilevered from the lift truck, said support frame including a lower frame, an upper frame and brace members, said brace members connected to said lower frame for supporting said upper frame in a raised position and cantilevered from the lift truck;

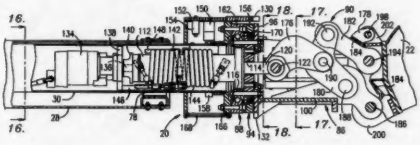
a carriage suspended from said upper frame by chain segments secured to said upper frame and to said carriage to allow said carriage to shift and sway, said carriage including at least two pairs of oppositely acting depending legs having feet members which extend laterally from said legs to engage an underside of the frame for handling the vehicle frame, said legs pivot about two parallel spaced cross members which are suspended from said support frame, said pairs of legs being connected by a cross brace which is actuated by a hydraulic device which extends between and connects said opposing pairs of legs.

5,486,084

MULTIPLE PURPOSE MATERIAL HANDLING AND WORKING APPARATUS

Raymond F. Pitman, 11400 Brookwood, Leawood, Kans. 66211; Richard J. Stallbaumer, Overland Park, Kans., and James A. Rusk, Kansas City, Mo., assignors to Raymond F. Pitman, Leawood, Kans.

Filed Jun. 7, 1993, Ser. No. 72,914
Int. Cl.[6] E02F *3/39*
U.S. Cl. 414—694 **11 Claims**



1. A mobile vehicle provided with a multiple purpose material handling and working apparatus for use with one or more tools, the apparatus comprising:

an articulated boom defining a longitudinal axis and including a free distal end;

a tool supporting boom extension supported on the free distal end of the articulated boom for rotation about an axis parallel to the longitudinal axis of the boom;

the boom extension including a body, a linkage structure movable between unpivoted and pivoted positions relative to the body, a coupling means for coupling each of the one or more tools to the linkage structure, and a linkage drive means mounted on and movable with the body for moving the linkage structure between unpivoted and pivoted positions, the linkage drive means including a cylinder-and-piston assembly supported on the body and extending beyond the body into the boom; and

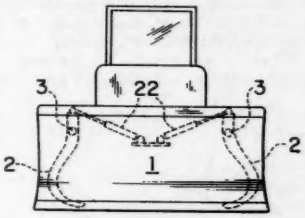
a rotary drive means supported on the boom for rotating the boom extension relative to the boom, the cylinder-and-piston assembly defining a central longitudinal axis about which the boom extension is rotated.

5,486,085

BLADED VEHICLE WITH LOAD GRIPPING ARMS

Daniel C. Gagne, Box 996, Invermeere, British Columbia, Canada, and Arie A. Pronk, Box 310, Fairmont Hotsprings, British Columbia, Canada

Filed Jul. 1, 1993, Ser. No. 84,585
Claims priority, application Canada, Sep. 21, 1992, 2078750
Int. Cl.[6] B66C *3/00*
U.S. Cl. 414—724 **13 Claims**



1. A vehicle having an earth working blade with load gripping means thereon,

said blade being substantially rectangular and having a front working surface, a back surface and first and second side edges, said load gripping means including an arm having a curved load engaging portion,

mounting means pivotally connecting said arm to said back surface of said blade adjacent said first edge thereof,

hydraulic means connecting said arm and said blade for providing movement to said arm relative to said blade,

said arm being adapted to move in a plane parallel to and adjacent to said back surface of said blade,

said curved portion of said arm being adapted to co-act with said first edge of said blade to form a pair of load gripping jaws therebetween and

wherein said load engaging portion of said arm is positionable in an area adjacent said back surface of said blade and between said ends of said blade.

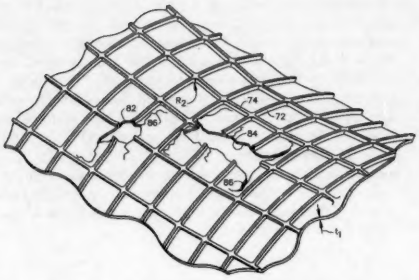
5,486,086

BLADE CONTAINMENT SYSTEM

Donald L. Bella, West Chester; Christopher C. Glynn, Hamilton, and Brian J. Humke, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 4, 1994, Ser. No. 177,297
Int. Cl.[6] F01D *25/24*
U.S. Cl. 415—9 **16 Claims**

1. In a gas turbine engine having a plurality of radially extending blades mounted on an annular disk, the blades and disk being rotatable about a longitudinal axis of the engine, a blade containment system comprising an annular casing positioned radially outward of the blades and in surrounding relationship therewith, said annular casing including a plurality of ribs on a radially outer



surface thereof, wherein at least one of said ribs is axially oriented with respect to said longitudinal axis and said ribs limit the propagation of cracks and holes formed in said annular casing.

5,486,087

UNIT FOR DELIVERING FUEL FROM A SUPPLY TANK TO AN INTERNAL COMBUSTION ENGINE

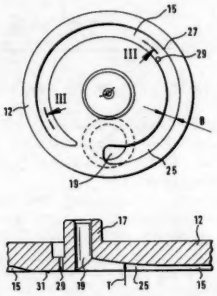
Juergen Treiber, Munich; Michael Kuehn, Bietigheim-Bissingen; Mathias Rollwage, Ditzingen; Dietrich Trachte, Leonberg, and Willi Strohl, Beilstein, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 14, 1994, Ser. No. 339,689

Claims priority, application Germany, Dec. 16, 1993, 43 43 078.3

Int. Cl.[6] F04D *29/40*

U.S. Cl. 415—55.1 **18 Claims**



1. A unit for delivering fuel from a supply tank to an internal combustion engine, comprising an intake cap (**12**), a disk-shaped impeller (**7**), that revolves in a pump chamber (**11**), a number of blades (**5**) extending radially outward are disposed on a circumference of said impeller, at least one supply conduit (**15**), which is open toward the impeller (**7**) and disposed in a region of the blades (**5**) of the impeller (**7**) in chamber walls (**13** and **16**) defining the pump chamber (**11**) on a face end and axially adjoining the impeller (**7**), said supply conduit (**15**) extends via a split ring around a pivot axis of the impeller (**7**) from an inlet opening (**19**) into the pump chamber (**11**) to an outlet opening (**21**) out of said pump chamber and has a different flow cross section in the flow course between the inlet opening (**19**) and the outlet opening (**21**), the cross section of the supply conduit (**15**), from an end that covers the inlet opening (**19**) toward the outlet end, decreases continuously over a certain angular range initially, forming a compression conduit (**25**), and once a certain value is reached continues constant as far as an end of the supply conduit (**15**) that covers the outlet opening (**21**), and between an inlet end and an outlet end of the supply conduit (**15**), a web (**31**) is formed in the intake cap (**12**) at a level of the blades (**5**) of the impeller (**7**), in which web a degassing bore (**29**) is provided that communicates with a low-pressure chamber.

5,486,088

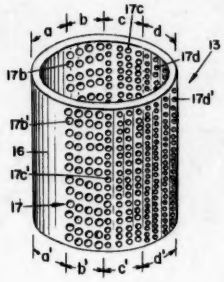
STEAM TURBINE STEAM STRAINER

Ronald E. Brandon, 627 Jubilee St., Melbourne, Fla. 32940

Filed Nov. 25, 1994, Ser. No. 344,862

Int. Cl.[6] F03B *11/08*

U.S. Cl. 415—121.2 **3 Claims**



1. In a steam turbine inlet which includes an annular steam strainer stationarily positioned therein for stopping the passage into the turbine of large metal particles, the improvement in the strainer which comprises:

a plurality of spaced through holes in a major portion of the strainer circumference, the through holes being of differing diameters, with holes of like diameter being positioned in longitudinally-extending, circumferential zones, holes of the largest diameter being disposed in zones where metal particles are least likely to enter the holes, holes of smaller diameter being disposed in zones where metal particles are most likely to enter the holes, and a longitudinally-extending, circumferential zone in the strainer without holes where the particle velocity and direction of movement would be damaging to any holes located in such a zone.

5,486,089

DIRECTIONAL CHANGEOVER PUMP

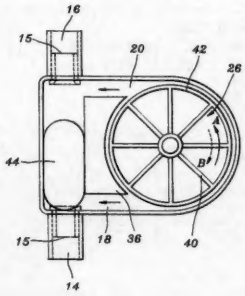
Ui-Shik Chung, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 15, 1994, Ser. No. 290,455

Claims priority, application Rep. of Korea, Feb. 28, 1994, 94-3822

Int. Cl.[6] F04D *1/00*

U.S. Cl. 415—146 **1 Claim**



1. A directional changeover pump for changing the direction of a fluid flow, which comprises:

a main body having a pair of discharge ports in opposite relationship, each of the discharge ports having a rubber seal inserted thereinto, a pair of guide channels in fluid communication with the discharge ports, a hole in which a shaft of a

motor is inserted, and a first guide member protruding between the guide channels;

an impeller aligned with the hole to be engaged with the shaft for supplying the fluid flow to one of the guide channels depending upon the rotational direction thereof;

a reciprocable member having an elongated configuration provided with a pair of semi-spherical portions at its opposite ends, for opening one discharge port and closing the other discharge port depending upon the rotational direction of the impeller; and

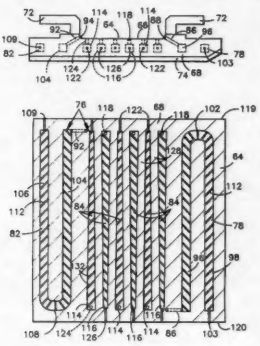
a cover having an inlet for supplying the fluid flow to the impeller and a second guide member incorporated with the first guide member to form a circular passageway for guiding the reciprocable member to move to and fro between the discharge ports.

5,486,090

TURBINE SHROUD SEGMENT WITH SERPENTINE COOLING CHANNELS

Ralph J. Thompson, and Daniel E. Kane, both of Tolland, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1994, Ser. No. 220,316
Int. Cl.[6] F01D *25/12*
U.S. Cl. 415—173.1 **18 Claims**



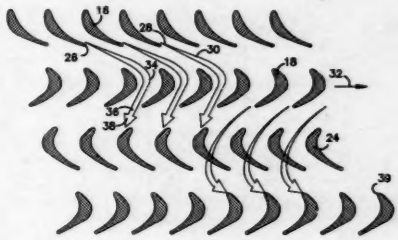
1. A shroud segment for a gas turbine engine having an annular flow path disposed about a longitudinal axis, a rotor assembly having a plurality of rotor blades extending radially through the flow path, and a shroud assembly including a plurality of the shroud segments being spaced circumferentially to define a flow surface radially outward of the rotor blades to bound a portion of the flow path, and means to inject cooling fluid onto the plurality of shroud segments, the shroud segment including a first surface, a back side disposed oppositely of the first surface, a pair of axial edges defining a leading edge and a trailing edge, first retaining means adjacent the leading edge and extending from the back side, second retaining means adjacent the trailing edge and extending from the back side, and a serpentine channel including an outer passage extending along one of the edges and outward of the retaining means extending adjacent that edge, an inner passage being inward of the outer passage and in fluid communication with the outer passage, and a duct extending to the inner passage from a location inward of the adjacent retaining means, the duct permitting fluid communication between the back side of the shroud segment and the serpentine channel such that a portion of the cooling fluid injected onto the back side flows through the serpentine channel.

5,486,091

GAS TURBINE AIRFOIL CLOCKING

Om P. Sharma, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 19, 1994, Ser. No. 229,979
Int. Cl.[6] F01D *1/00*
U.S. Cl. 415—194 **7 Claims**



1. In a gas turbine engine having N first stage vanes, a plurality of rotating first stage blades, and N second stage vanes there being an arcuate span between each of said second stage vanes, the method of establishing the circumferential position of said second stage vanes with respect to said first stage vanes comprising:

selecting the anticipated longest term operating condition;

determining at said operating condition the path of the wake flow from said first vane to said first blade;

determining at said operating condition the further path of said wake flow passing through said first blades;

determining at said operating condition the further flowpath of said wake flow to said second stage vanes; and

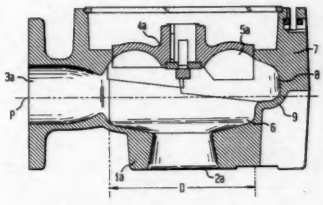
locating the leading edge of said second stage vanes within 25% of the pitch of said second stage vanes with respect to said wake flow.

5,486,092

HOUSING FOR A VORTEX-FLOW TYPE PUMP

Torolf Borg, Hasselby, and Per E. Strinning, Spanga, both of, Sweden, assignors to ITT Flygt Ab, Solna, Sweden

Filed Oct. 3, 1994, Ser. No. 317,079
Int. Cl.[6] F04D *17/00*
U.S. Cl. 415—225 **10 Claims**



1. An improved pump housing of the so-called vortex-flow type, having an impeller with vanes, an axial inlet, a tangential-to-radial outlet, and upper and lower housing portions, wherein the improvement comprises:

said lower housing portion is essentially of circular design; and

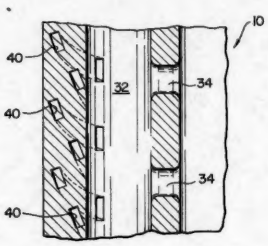
said upper housing portion has a volute conformation, with a continuously increasing radius in the direction of said outlet.

5,486,093

LEADING EDGE COOLING OF TURBINE AIRFOILS

Thomas A. Auxier, Palm Beach Gardens, and Kenneth B. Hall, Jupiter, both of Fla., assignors to United Technologies Corportion, Hartford, Conn.

Filed Sep. 8, 1993, Ser. No. 118,158
Int. Cl.[6] B63H *1/14*
U.S. Cl. 416—97 R **4 Claims**



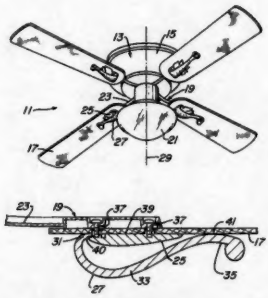
1. An air cooled airfoil for a turbine blade of a gas turbine engine, said airfoil having a root section, a tip section, a leading edge, a pressure side, a suction side and a trailing edge, a longitudinal passageway extending from said root section to said tip section for leading cooling air internally of said airfoil, said longitudinal passageway being disposed between said suction side and said pressure side, another longitudinal passage extending adjacent said leading edge and including longitudinally spaced holes interconnection said longitudinal passageway and said another longitudinal passageway, and means for supplying air to be admitted into said root section, the improvement comprising a plurality of helical shaped holes extending from said another longitudinal passageway to the exterior of said airfoil adjacent to said leading edge for discharging cooling air from said airfoil and each helical shaped holes being curved toward said leading edge, whereby heat transfer by convection in the leading edge is enhanced.

5,486,094

CEILING FAN BLADE MOUNTING BRACKET AND SUPPORT ARMS PROVIDING TWO FAN BLADE SUPPORT POINTS

William S. Davis, Jr., and Julia A. Morrow, both of Fort Worth, Tex., assignors to Davoil, Inc., Fort Worth, Tex.

Filed Feb. 9, 1995, Ser. No. 386,281
Int. Cl.[6] F04D *29/34*
U.S. Cl. 416—210.R **9 Claims**



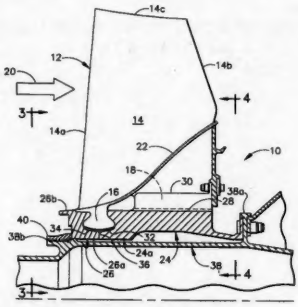
8. A ceiling fan, comprising in combination:
a motor;
a plurality of mounting brackets;
a plurality of fan blades, each having an upper surface and a lower surface;
mounting means for mounting each of the fan blades to one of the mounting brackets;
the mounting means for each of the fan blades comprising a plate having an inward edge containing a shoulder, the plate being in abutment with the lower surface of the fan blade, and a plurality of fasteners extending from the plate, through the blade and into the mounting bracket; and
the mounting means for each of the fan blades further comprising a support arm having an inward portion which is clamped by the fasteners between the shoulder of the plate and the lower surface of the fan blade, the support arm having a central portion extending below the plate, and the support arm further having an outer portion extending upward into contact with the blade at a point outward of the plate.

5,486,095

SPLIT DISK BLADE SUPPORT

James E. Rhoda, Mason; Thomas A. Bradley, Milford, and Mark J. Mielke, Blanchester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 8, 1994, Ser. No. 351,997
Int. Cl.[6] F01D *5/14*
U.S. Cl. 416—214 A **9 Claims**



1. A blade support comprising:
a first disk having a plurality of circumferentially spaced apart, axial dovetail slots at one end thereof, and a circumferential dovetail first half-slot at an opposite end thereof;
a plurality of rotor blades each having an airfoil and axially spaced apart circumferential and axial dovetails integrally joined thereto, said axial dovetail being disposed in a respective one of said axial dovetail slots in said first disk, and said circumferential dovetail being disposed in part in said first half-slot of said first disk;
a second disk having a circumferential dovetail second half-slot at one end thereof disposed in abutting contact with said blade circumferential dovetails and said first disk for receiving a remaining part of said circumferential dovetails, with said first and second half-slots collectively defining a complete circumferential dovetail slot for supporting said blade circumferential dovetails therein; and
means for retaining together said first and second disks.

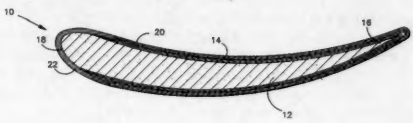
5,486,096

EROSION RESISTANT SURFACE PROTECTION

Christopher J. Hertel, Glastonbury, and Charles R. Watson, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 30, 1994, Ser. No. 268,592
Int. Cl.[6] F01D *5/28;* **B64C** *27/473;* **B05D** *3/02;* **B32B** *27/38*
U.S. Cl. 416—224 **11 Claims**

1. An erosion resistant surface coating for an epoxy matrix composite airfoil comprising a toughened epoxy film co-cured on the surface of the composite airfoil.

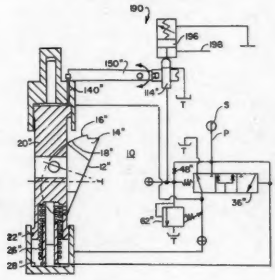


5,486,097

CONTROL FOR A VARIABLE DISPLACEMENT AXIAL PISTON PUMP

Larey D. Schaffner, Baltimore, Ohio, assignor to Denison Hydraulics Inc., Marysville, Ohio

Filed Jan. 26, 1995, Ser. No. 378,712
Int. Cl.[6] F04B *1/26*
U.S. Cl. 417—222.1 **8 Claims**



1. A torque limiter control for setting the power output of a variable displacement, pressure compensated pump having an inlet and a working pressure fluid outlet, a movable swash plate, a movable control piston mounted in a first bore and attached to said swash plate for setting the displacement of the pump and movable between a first control position of maximum pump displacement and a second control position of minimum pump displacement and spring means for spring biasing said control piston toward said first position which comprises:

a housing having a second bore for receiving a metering compensator spool, a tank port adapted to be connected to case which opens into said second bore, an outlet port adapted to receive control pressure fluid which opens into said second bore, and a control port adapted to be connected to said first bore of said control piston and said second bore;

a metering compensator spool slidable mounted in said second bore having a metering orifice and a metering land and movable between a first spool position in which said outlet port is in fluid communication with said control port such that control pressure fluid is directed to said control piston to move said control piston toward said second control position, a second spool position in which said tank port is in fluid communication with said control port such that pressure fluid is drained from said control piston to enable said spring means to bias said control piston toward said first control position and an intermediate position in which said control port is blocked by said land;

a source of control pressure fluid connected to said metering orifice and said second bore;

a hollow vent sleeve having a vent port slidable in a third bore which bore is downstream of and in fluid communication with said metering orifice such that said vent port receives control pressure fluid which passes through said metering orifice;

a slidable clevis which receives said vent sleeve and overlies said vent port;

a torque limiter set adjustment which applies a torque setting force to said vent spool to bias said vent sleeve such that said clevis overlies said vent port to prevent fluid in said vent port from exiting said vent port and thereby causing a pressure drop across said metering orifice until the pressure of said control fluid provides a force which exceeds that of said torque limiter set adjustment;

a feedback pin connected to and movable with said control piston to indicate pump displacement; and

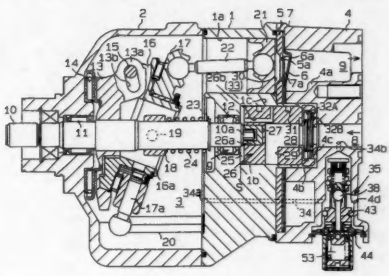
a pivotal feedback link drivingly connected to said feedback pin and to said vent sleeve such that said feedback link causes said clevis to slide along said vent sleeve in response to movement of said control piston and thereby modulate said torque setting force at the interface of said vent port and said clevis as pump displacement changes.

5,486,098

SWASH PLATE TYPE VARIABLE DISPLACEMENT COMPRESSOR

Kazuya Kimura; Masafumi Ito; Hideki Mizutani; Yoshihiro Makino; Suguru Hirota; Taro Ozeki; Keiichi Kato, and Hiroaki Kayukawa, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 23, 1993, Ser. No. 173,506
Claims priority, application Japan, Dec. 28, 1992, 4-347843
Int. Cl.[6] F04B *1/12*
U.S. Cl. 417—222.2 **12 Claims**



1. A swash plate type variable displacement compressor comprising:

a casing containing a plurality of cylinder bores;

a separate piston disposed in each of said cylinder bores for reciprocation therein, each of said pistons varying the volume of a separate working chamber in front of the piston head in the cylinder bore that contains the piston, said volume varying in accordance with the reciprocation of the respective piston;

a suction chamber and a discharge chamber provided in said casing;

suction valve means for admitting a low pressure gas into each of said working chambers by enabling communication between each of said working chambers and said suction chamber during a suction stroke when movement of the associated one of said pistons increases the volume of the associated working chamber;

discharge valve means for allowing high pressure gas in each of said working chambers to pass into said discharge chamber by establishing communication between each of said working chambers and said discharge chamber during a compression stroke when movement of the associated one of said pistons decreases the volume of the associated working chamber;

a crank chamber communicating with each of said cylinder bores to the rear of said pistons;

a drive shaft rotatably provided in said crank chamber;

a swash plate tiltably supported on said drive shaft and connected to each of said pistons through associated rods, said swash plate making said pistons reciprocate in response to its undulating swing motion and varying its inclination angle based upon the pressure differential between pressure in said suction chamber and pressure in said crank chamber, whereby

the stroke of each of said pistons varies for adjusting discharge displacement in relation to said pressure in said suction chamber;

a gas supply passage for connecting each of said cylinder bores with said crank chamber in order to supply gas to said crank chamber from said cylinder bores during said compression stroke;

a gas bleed passage for connecting said crank chamber to said suction chamber in order to pass gas from said crank chamber to said suction chamber;

a pressure control valve provided in at least one of said gas passages for controlling the pressure of gas in said crank chamber by opening and closing said at least one of said gas passages; and

a gas control valve for opening and closing said gas supply passage in the middle of said compression stroke of each of said pistons.

5,486,099

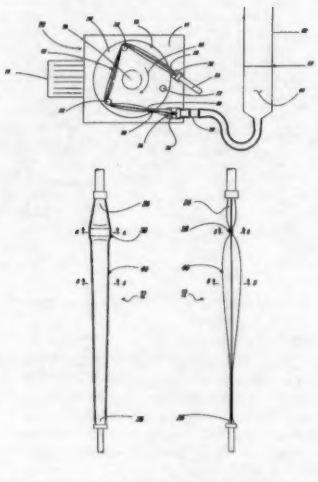
PERISTALTIC PUMP WITH OCCLUSIVE INLET

Jean P. Montoya, Ann Arbor, Mich., assignor to Michigan Critical Care Consultants, Inc., Ann Arbor, Mich.

Filed Dec. 14, 1994, Ser. No. 355,700

Int. Cl.[6] F04B *43/08*; F16L *11/08*

U.S. Cl. 417—477.13 **17 Claims**



1. A peristaltic pump for pumping fluids comprising:

a frame having a plurality of rollers and carrier means for carrying said rollers in spaced apart relation along a predetermined path;

drive means for causing movement of said carrier means thereby inducing said rollers to move along said predetermined path;

a flexible conduit having integrally formed first and second segments located between an inlet end and an outlet end, said first segment located upstream from said second segment and said first segment being collapsed and a passageway therethrough being substantially completely occluded in a free condition when pressure within said first segment is equal to pressure acting on the outside of said first segment thereby preventing the transmission of fluids therethrough, said first segment assuming an inflated condition having an unobstructed passageway when pressure within said first segment is greater than the pressure acting on the outside of said first segment thereby permitting the transmission of fluids therethrough, said second segment being biased to exhibit an inflated condition with an open passage therethrough in a free condition when pressure within said second segment is equal to pressure acting on the outside of said first segment thereby permitting the transmission of fluid therethrough; and

mounting means for engaging said inlet and outlet ends and for mounting said conduit about said rollers whereby said conduit cooperates along part of its length with said rollers without use of a stator to thereby transmit fluid through said conduit by peristaltic movement.

5,486,100

PASTA MAKER WITH DUAL KNEADING BLADES

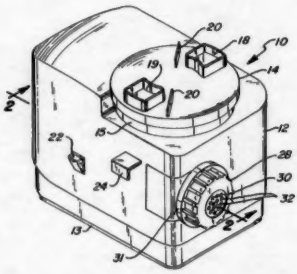
Maxwell Hsu, Taipei, Taiwan, Prov. of China, assignor to Airlux Electrical Co., Ltd., Taipei, Taiwan, Prov. of China

Continuation-in-part of Ser. No. 182,000, Jan. 14, 1994, Pat. No. 5,401,159. This application May 13, 1994, Ser. No. 242,413

The portion of the term of this patent subsequent to Mar. 28, 2012, has been disclaimed.

Int. Cl.[6] B29B *1/06*; B01F *7/18*

U.S. Cl. 425—190 **13 Claims**



1. An improved pasta maker for preparing fresh pasta and other farinaceous pastes comprising:

a container having a circular shaped bottom wall, a cylindrical shaped side wall perpendicular to and attached to said bottom wall, and an open top side, said side wall, open top side and bottom wall being symmetrical about a vertical axis;

a spindle protruding upwardly through said bottom wall defining said vertical axis, said spindle having a top and bottom end;

a pair of opposed kneading blades attached adjacent to said bottom end of said spindle, said blades positioned on opposing sides of said bottom end and extending radially away from said vertical axis, said kneading blades each having a leading edge and a trailing edge, which are substantially parallel to said bottom wall;

at least one mixing blade attached adjacent to said spindle above said kneading blade and extending radially away from said vertical axis; and

a drive means connected to said spindle for spinning said spindle.

5,486,101

DEVICE FOR CLAMPING A HALF-MOULD ONTO A PLATEN OF A MOULDING MACHINE, AND MOULDING MACHINE FITTED WITH SUCH A DEVICE

Jean-François Guyon, Groissiat, France, assignor to Billion S.A., Bellignat, France

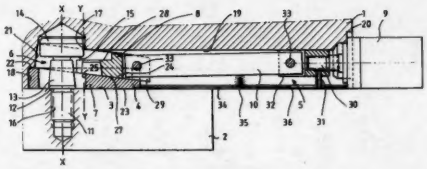
Filed Jun. 23, 1994, Ser. No. 264,619

Claims priority, application France, Jun. 23, 1993, 93 07647

Int. Cl.[6] B29C *33/30*

U.S. Cl. 425—192 R **16 Claims**

1. Device for clamping a half-mold (2) onto a platen (1) of a molding machine, comprising a peg (6) which projects from the half-mold and which is received in a recess (17) in the platen, and a clamping mechanism (5) including a transverse cylinder (9) operatively associated with a wedge (8) designed to interact with



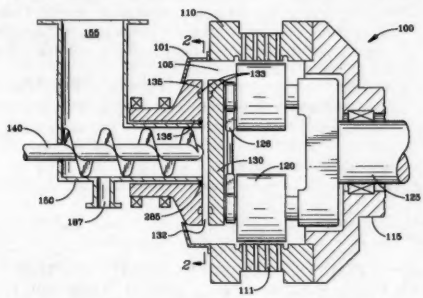
the peg in order to removably clamp the half-mold onto the platen, the clamping mechanism (**5**) comprising a bearing block (**7**) removably fixed at an entrance of the recess (**17**) and including a passage (**25**) for the peg (**6**) and an incline (**24**) for the bearing of the wedge (**8**), said incline being provided on a face of the block which points towards the recess in the platen, the peg (**6**) being axisymmetric and including a widened head (**14**) on an inner face (**15**) of which the wedge acts.

5,486,102

HIGH INTENSITY PELLET MACHINE

Gordon E. Ettie, Minneapolis, Minn., and Donald M. Wilhelm, Novato, Calif., assignors to California Pellet Mill Company, San Francisco, Calif.

Filed May 2, 1994, Ser. No. 236,066
Int. Cl.[6] B29B *7/38;9/00*
U.S. Cl. 425—202 **14 Claims**



1. A pellet mill for pelleting feed product, comprising:

a pelleting die having a plurality of extrusion holes for extruding said feed product;

roller means, rotatable relative to the pelleting die, for forcing feed product through said extrusion holes;

means for mixing and shearing the feed product before introducing said feed product to said pelleting die, the means for mixing and shearing the feed product comprising a solid round disc occluding all but a narrow annular region adjacent to the pelleting die; an annular disc, facing said solid round disc and spaced therefrom by a narrow adjustable gap, and having an open center through which feed product is introduced; and substantially radial grooves arrayed about the proximal faces of said discs, at least one of said discs being rotatable; and

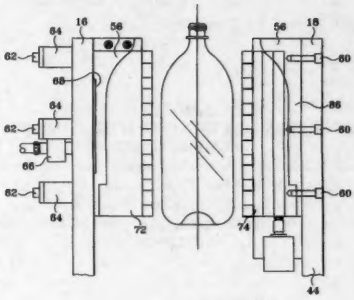
means for positively conveying the feed product into said means for mixing and shearing.

5,486,103

BLOW MOLD CLAMP ASSEMBLY

David P. Meiring, Troy, and Lynn R. Maggert, Arcanum, both of Ohio, assignors to Electra Form, Inc., Vandalia, Ohio

Filed May 9, 1994, Ser. No. 239,501
Int. Cl.[6] B29C *49/00*
U.S. Cl. 425—541 **18 Claims**



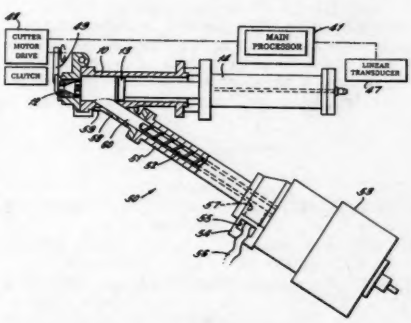
1. A blow mold assembly comprising a first and second carriage, motive means for moving at least one of the first and second carriages between an open position and a closed position, guide means for guiding the movement of the at least one carriage along a line of movement between the open and closed positions, at least one first and second mold half coupled respectively to the first and second carriages for movement therewith to define in the closed position at least one blow mold cavity, and mounting means movably mounting said at least one first mold half to the first carriage, the mounting means including biasing means for biasing the first mold half away from the second mold half and displacement means for displacing the first mold half away from the first carriage and toward the second mold half when the carriages are in the closed position to insure continuous mating of the two mold halves defining said at least one blow mold cavity.

5,486,104

HYDRAULIC RAM OPERATED EXTRUDERS

Richard C. Cowley, Ely, United Kingdom, assignor to Barwell International Limited, Swavesey, United Kingdom

Continuation of Ser. No. 144,761, Oct. 28, 1993, abandoned. This application May 2, 1995, Ser. No. 432,685
Claims priority, application United Kingdom, Jan. 29, 1992, 9222751; Jul. 19, 1993, 9314904
Int. Cl.[6] B29C *47/92*
U.S. Cl. 425—142 **11 Claims**



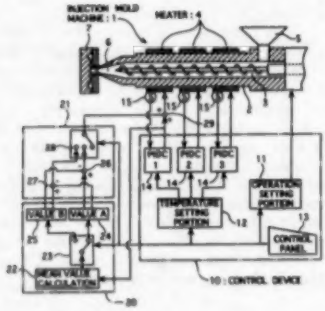
1. A hydraulic ram operated extruder comprising a cylinder, a ram movably disposed within said cylinder, an extrusion die from which an extrudate is delivered, substantially continuously moving cutter means at the die to sever the extrudate repeatedly to produce individual pieces of extrudate, means to drive the cutter means at a controlled speed, means to deliver hydraulic fluid to the ram at a substantially constant volume flow rate, means to monitor movement of the ram in the cylinder, means to determine from said ram movement the speed of advance of the ram, and a control means responsive to said speed of advance of the ram in the cylinder for controlling the speed of operation of the cutter means whereby the

volume of individual blanks is controlled and blanks of substantially equal volume are produced.

5,486,105
APPARATUS FOR CONTROLLING A HEATING TEMPERATURE

Hirofumi Katsumata, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1993, Ser. No. 165,472
Claims priority, application Japan, Dec. 14, 1992, 4-332755
Int. Cl.[6] B29C *45/78*
U.S. Cl. 425—143 **11 Claims**



1. An apparatus for controlling a heating temperature of an object being heated, the object having several operation states, said apparatus comprising:

control means for controlling heating of the object while in one of said several operation states;

heating means for heating the object;

calculation means for calculating a mean value of control inputs sent from said control means to the heating means during every state of said several operation states; and

compensation means for adding to the control input a calculation result as compensating input resulting from a predetermined calculation using two values among the mean values of the control inputs processed in said calculation means,

wherein the mean values calculated by said calculation means are successively stored for every state of said several operation states, and wherein the mean values are selected by said compensation means corresponding to an operation state of the object before and after alteration thereof.

5,486,106
HYDRAULIC DEVICE FOR SUPPLYING A HYDRAULIC DRIVING UNIT

Karl Hehl, Arthur-Hehl-Str. 32, D-72290 Lossburg, Germany

Filed Oct. 14, 1994, Ser. No. 321,893
Claims priority, application Germany, Jan. 18, 1993, 43 35 403.3
Int. Cl.[6] B29C *45/80*
U.S. Cl. 425—145 **5 Claims**

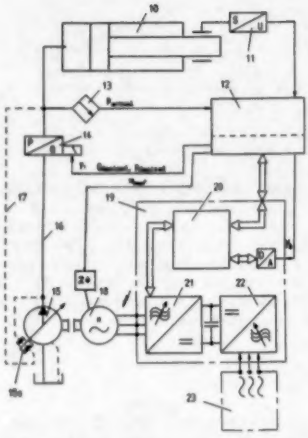
1. A hydraulic device for supplying a hydraulic driving unit in an injection molding machine for processing synthetic materials comprising

at least one variable capacity pump,

a main line extending from said variable capacity pump to said driving unit,

at least one control valve arranged in said main line and adapted to determine a quantity and a pressure of hydraulic fluid in said main line,

a controlling mechanism connected with said variable capacity pump for control of said pressure,



a control conduit which connects said controlling mechanism of said variable capacity pump with said main line downstream of said control valve,

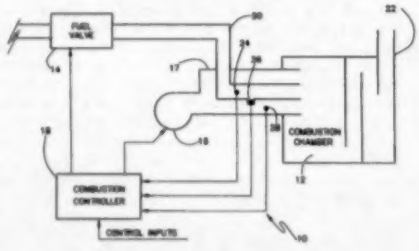
at least one pressure transducing means arranged for transducing an actual pressure value downstream of said control valve; comparing means for comparing said actual pressure value with a nominal pressure value and supplying a first correcting variable for said controlling mechanism in dependency of result of said comparing means,

said variable capacity pump being driven by a rotary current motor which is connected to a current source, and a speed of rotation of said rotary current motors being regulated via a frequency converter arranged between said current source and said rotary current motor.

5,486,107
DETERMINATION OF FUEL CHARACTERISTICS

Ulrich Bonne, Hopkins, Minn., assignor to Honeywell, Inc., Minneapolis, Mich.

Continuation of Ser. No. 828,135, Jan. 30, 1992, abandoned.
This application Sep. 6, 1994, Ser. No. 301,225
Int. Cl.[6] F23N *5/00*
U.S. Cl. 431—12 **26 Claims**



1. A method for determining thermophysical or thermochemical property values of a natural or other hydrocarbon-based gaseous fuel gas with microbridge type sensors, comprising the steps of:

applying the fuel to a static microbridge type sensor to obtain the thermal conductivity value of the fuel wherein the microbridge type sensor is fluidly coupled to receive the fuel and provide a signal value, thermal conductivity, k, of the fuel;

applying the fuel to a static microbrid type sensor to obtain the specific heat value of the fuel wherein the microbridge type

sensor is fluid coupled to receive the fuel and provide a signal value, specific heat, c_p, of the fuel;

correcting the values of signals k and c_p through the use of a plurality of measured sensor signal values k and c_p taken at different temperatures so as to be able to process these values to obtain corresponding values at reference conditions for the fuel;

processing the plurality of measured different temperature values of c_p to obtain a value for dc_p/dT at the said reference condition of c_{ps},

processing the plurality of measured different temperature values of k_s to obtain a value for dk/dT at the said reference condition of k_s,

processing in a processor the values obtained in the previous steps to obtain the desired property of the fuel according to a relationship selected from:

$$Y_s = A_0 + A_1 k_s^{n1} c_{ps}^{m1} x_s^{p1} y_s^{q1} T_s^{r1} P_s^{s1} + A_2 k_s^{n2} c_{ps}^{m2} x_s^{p2} y_s^{q2} T_s^{r2} P_s^{s2} + \ldots .$$

$$= \Sigma_i A_i k_s^{ni} c_{ps}^{mi} x_s^{pi} T_s^{ri} P_s^{si}$$

where

Y_s represents a thermophysical or thermochemical parameter of interest selected from any of the higher heating value, H; oxygen demand, D; Wobbe Index, Wo; relative density or specific gravity, ρ; absolute density, ρ_a; inerts, I; compressibility factor, Z; critical compression ratio, R_c; viscosity, η;

A_0, A_1 ... A_i are constants or coefficients,

n_i, m_i, p_i, q_i, r_i, s_i are exponents of values from −20 to 20, including zero, with the number of terms, i, ranging from 1 to 15,

k_s and c_{ps} represent their values at a predetermined reference condition of temperature and pressure,

x_s represents dk/dT at the reference condition,

Y_s represents dc_p/dT at a reference condition,

T_s represents temperature at the reference condition,

P_s represents absolute pressure at the reference condition.

5,486,108

GAS BURNER

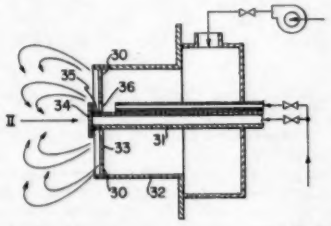
Norikazu Kubota, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 880,129, May 7, 1992, abandoned. This application Nov. 6, 1992, Ser. No. 972,706

Claims priority, application Japan, May 7, 1991, 3-101514; May 27, 1991, 3-121123; Jun. 27, 1991, 3-157156; Jan. 22, 1991, 3-301229; Nov. 20, 1991, 3-304751

Int. Cl.[6] F23D *14/46*

U.S. Cl. 431—181 **14 Claims**



1. A gas burner comprising:

a gas nozzle having a first flame stabilizer mounted to a front end thereof, said nozzle having a plurality of gas blow apertures adjacent said first flame stabilizer for discharging fuel gas spaced at equal intervals around its outer surface,

a plate forming a second flame stabilizer through which said gas nozzle front end extends, said second flame stabilizer having a plurality of secondary combustion air passages around its periphery for discharging secondary combustion air and a primary combustion air passage around said gas nozzle which extends through said second flame stabilizer for discharging primary combustion air,

a burner housing having a front end, said second flame stabilizer plate being mounted within said housing front end; and

a mixture of fuel gas from said nozzle gas blow apertures and primary combustion air from said second flame stabilizer primary air passage flowing radially outward of said nozzle between said first and second flame stabilizers as guided by said first flame stabilizer, which mixture mixes with a portion of the secondary combustion air supplied from the secondary combustion air passages of said second flame stabilizer, said second flame stabilizer being spaced from and located inward of said front end of the burner housing in which the secondary combustion air flows straight and said first flame stabilizer being located closer to said front end of said burner housing than said second flame stabilizer.

5,486,109

CLINICAL APPLIANCE AND HANDLE

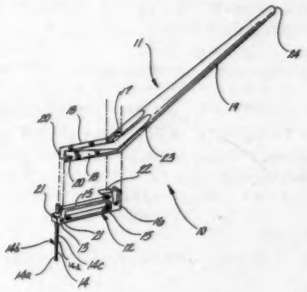
Kelly A. Hunter, and Frank Hunter, both of 93 Ocean View Drive, Terrigal, New South Wales 2260, Australia

Division of Ser. No. 941,128, Dec. 22, 1992, Pat. No. 5,322,437. This application Mar. 25, 1994, Ser. No. 218,371

Claims priority, application Australia, May 7, 1990, PK0009

Int. Cl.[6] A61C *19/04;3/00*

U.S. Cl. 433—72 **5 Claims**



1. A clinical appliance for application to a tissue, or a tissue associated material comprising a head, a handle and a pressure sensitive means which comprises the attachment of the head and the handle by a resiliently deformable member, and an instrument adapted to be retained in said head, said head and said handle each having disposed thereon a mark which when no force is exerted on the instrument are out of alignment, but when a selected force is exerted will be aligned, said instrument comprising a sampling apparatus with a portion for application to a tissue or tissue associated material, the portion being an elongate member having calibrations with increment markings to indicate depth, the increment markings defining zones therebetween, each zone having a unique color, said portion being useful for sampling tissue, fluid or other matter from said tissue or tissue associated material.

5,486,110

DENTURE RETAINING DEVICES

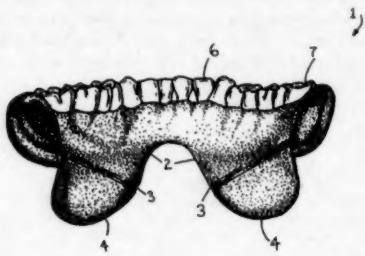
Christopher M. Wilson, R.R.2 Box 1230, Morrisville, Vt. 05661, and Bryan S. Booth, 58 N. Main St., Rutland, Vt. 05701

Continuation of Ser. No. 163,751, Dec. 7, 1993, Pat. No. 5,354,201. This application Oct. 7, 1994, Ser. No. 319,664

The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

Int. Cl.[6] A61C *13/02*

U.S. Cl. 433—177 **15 Claims**



1. In combination, a dental appliance having a substantially rigid flanged section and a device for securing and stabilizing the appliance, said combination further comprising:

at least one substantially rigid flange extension having a surface dimensioned and configured to continuously contact intraoral tissue;

means for hingedly attaching said flange extension to the flanged section of the dental appliance; and

biasing means for providing positional memory to said flange extension with respect to the flanged section of the dental appliance; whereby

said flange extension provides pressure to the intraoral tissue to stabilize the dental appliance.

5,486,111

FOREIGN LANGUAGE TEACHING AID AND METHOD

C. Kay Watkins, 2809 San Medina, Dallas, Tex. 75228

Continuation-in-part of Ser. No. 828,777, Jan. 30, 1992, Pat. No. 5,275,569. This application Jan. 4, 1994, Ser. No. 177,079

Int. Cl.[6] G09B *19/06*

U.S. Cl. 434—157 **14 Claims**

14. A language translation teaching method comprising the steps of:

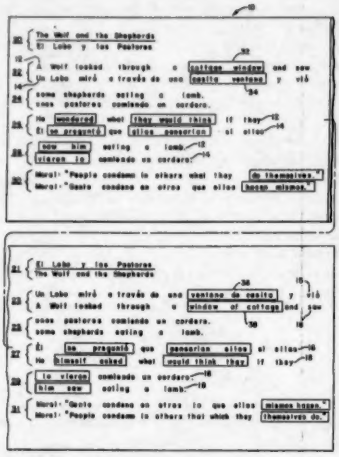
(a) presenting on a first page, a first line of words printed in a first language and having a first meaning according to the normal rules of syntax and grammar of said first language;

(b) translating said first line of words in a second language both in a word-for-word translation and into an accurate translation of said first meaning in said second language according to normal rules of syntax and grammar of said second language;

(c) presenting on said first page, printed below said first printed line of words, said word-for-word translation in a second language;

(d) presenting on a second page, a third line of words, printed in second language as said accurate translation of said first line on said first page, having a meaning in said second language according to the normal rules of syntax and grammar of said second language which is the same as said first meaning; and

(e) presenting on said second page, printed below said third printed line of words, a word-for-word translation of said third line in said first language.


The Wolf and the Shepherds
El Lobo y los Pastores
A Wolf looked through a cottage window and saw
Un Lobo miró a través de una casita ventana y vió
some shepherds eating a lamb.
unos pastores comiendo un cordero.
He wondered what they would think if they
El se preguntó que dirían pensarían si ellos
saw him eating a lamb.
viarán lo comiendo un cordero.
Moral: "People condemn in others what they do themselves."
Moral: "Gente condena en otros que ellos hacen mismos."

5,486,112

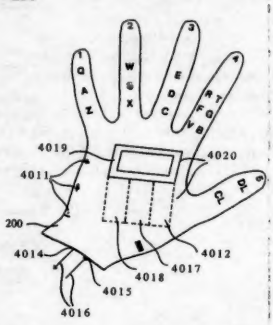
AUTONOMOUS WEARABLE COMPUTING DEVICE AND METHOD OF ARTISTIC EXPRESSION USING SAME

Farideh Troudet, and Terry Troudet, both of 18612 Buccaneer Creek - P.O. Box 360664, Strongsville, Ohio 44136

Continuation-in-part of Ser. No. 128,821, Sep. 28, 1993, which is a continuation-in-part of Ser. No. 912,874, Jul. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 770,610, Oct. 3, 1991, abandoned. This application Nov. 30, 1993, Ser. No. 159,194

Int. Cl.[6] A63B *69/00*

U.S. Cl. 434—250 **15 Claims**



12. A method of artistic expression through a unique creative blending of dance, music, poetry, and colorful light show, within the limitation of a single signal generating tool, comprising the following identifiable steps of:

1) providing an artist with a first glove having fingers and a second glove having fingers, said first glove being adapted to fit the left hand of said artist, said first glove having a first portion on a palm side and a second portion on a back side, said second glove being adapted to fit the right hand of said artist, said second glove having a third portion on a palm side and a fourth portion on a back side, said first glove having a first set of indicia mounted on said first portion thereof and a second set of indicia mounted on said second portion thereof, said second glove having a third set of indicia mounted on said third portion thereof and a fourth set of indicia mounted on said fourth portion thereof;

first keys mounted within the first portion of said first glove in association with each indicium of said first set of indicia,

said first keys corresponding to the keys of a keyboard to be struck by the fingers of the left hand, said first keys having indicia mounted thereon, said indicia identifying the letters, numbers, or symbols associated to said first keys;

second keys mounted within the third portion of said second glove in association with each indicium of said third set of indicia, said second keys corresponding to the keys of said keyboard to be struck by the fingers of the right hand, said second keys having indicia mounted thereon, said indicia identifying the letters, numbers, or symbols associated to said second keys;

the positions of said first set of indicia and said second set of indicia being mirror images of each other, said second set of indicia being individually connected on a one-to-one basis with their said mirror-image first set of indicia, said second set of indicia thereby providing a representation of said first keys;

the positions of said third set of indicia and said fourth set of indicia being mirror images of each other, said fourth set of indicia being individually connected with their said mirror-image third set of indicia; said fourth set of indicia thereby providing a representation of said second keys;

means for providing said first keys with the same functionality as the keys of said keyboard to be struck by the fingers of the left hand, and for providing said second keys with the same functionality as the keys of said keyboard to be struck by the fingers of the right hand;

a first microprocessor connected through a first set of interconnections to said first keys of said first glove, said first set of interconnections being embedded within said first glove;

a second microprocessor connected through a second set of interconnections to said second keys of said second glove, said second set of interconnections being embedded within said second glove;

said first microprocessor having the functionality of a keyboard microprocessor for the keys of said first glove, said second microprocessor having the functionality of a keyboard microprocessor for the keys of said second glove; said first microprocessor monitoring the flow of data input through the keys of said first glove, said second glove microprocessor monitoring the flow of data input through the keys of said second glove;

a set of internal switches mounted within said gloves, said switches being activated by light tactile pressure, said activated switches providing said gloves with a specific and pre-programmed information content corresponding to that of a keyboard having the desired format and content;

a first set of external output ports mounted within said first glove and connected to said first microprocessor, and a second set of external output ports mounted within said second glove, and connected to said second microprocessor; said output ports comprising radio-wave emitters for emitting electromagnetic waves to be captured by an external processing unit;

said gloves allowing said artist to adaptively choose during performance among pre-programmed glove configurations the one having the desired format and content;

2) instructing said artist to adaptively switch said glove configuration to the desired format and content through light tactile pressure of the corresponding switches;

3) instructing said artist to strike said keys of said gloves through light tactile pressure of the thumbs; and

4) instructing said artist to self-express by harmonizing the motions of the dance with art media remotely controlled and blended by said artist.

5,486,113

DEVICE FOR CONNECTING A CIRCUIT BOARD TO A CONNECTOR PLANE

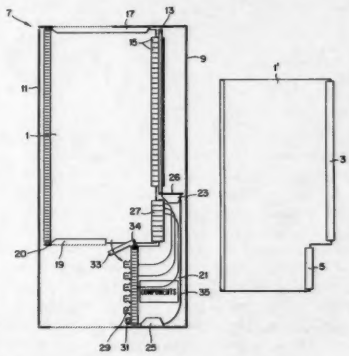
Peter C. B. Lundh, Farsta, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 24, 1994, Ser. No. 216,956

Claims priority, application Sweden, Mar. 25, 1993, 9300997

Int. Cl.[6] H05K *7/00*

U.S. Cl. 439—61 **28 Claims**



1. A device for connecting a circuit board to a connection panel, the connection panel having panel connector contacts for connecting the panel to a plurality of circuit boards and each circuit board comprising first connector contacts for connecting to the panel connector contacts, the first connector contacts disposed such that the circuit board is displaced in a direction towards the connection panel for connection thereto; and second connector contacts for transferring signals between the circuit board and external devices, the device comprising:

a wiring connector unit having a generally rectangular shape comprising a front edge having a surface, an opposite rear edge, a top edge facing the first connector contacts and an opposite bottom edge and including:

third connector contacts located at the front edge surface for connecting to the second connector contacts, the third connector contacts engaging the second connector contacts when the circuit board is connected to the connection panel;

fourth connector contacts locate at the front edge surface for connection to the external devices, the fourth connector contacts electrically connected to the third connector contacts; and

guides for cooperating with the top and bottom edges of the wiring connector unit to cause the wiring connector unit to be displaced in generally the same direction as the circuit board for connection thereto.

5,486,114

MOTHER BOARD-TO-DAUGHTER BOARD ELASTOMERIC ELECTRICAL CONNECTOR

Lucas Soes, Rosmalen, and Hermann P. J. Gilissen, Esch, both of, Netherlands, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Feb. 10, 1994, Ser. No. 194,439

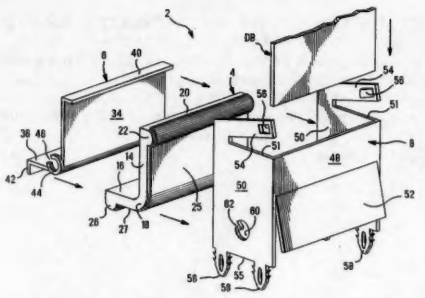
Claims priority, application United Kingdom, Feb. 22, 1993, 9303533

Int. Cl.[6] H01R *9/09*

U.S. Cl. 439—62 **10 Claims**

1. An electrical connector for interconnecting first conductors on a mother circuit board to respective second conductors on a daughter circuit board, the connector comprising;

an elastomeric connector element having first and second substantially orthogonally projecting nodes and third conductors



each having a first contact surface on the first node and a second contact surface on the second node;

and a housing receiving the connector element, the housing having means for securing it to the mother board with the second contact surfaces engaging respective ones of the first conductors, and means for latching the daughter board to the housing in a latched position with the first contact surfaces engaging respective ones of the second conductors;

characterized in that the elastomeric connector element is mounted in the housing on a spring support so as to be rockable against the action thereof by the act of latching the daughter board to the housing, whereby in the latched position of the daughter board the first contact surfaces are spring loaded by said spring support against the second conductors.

5,486,115

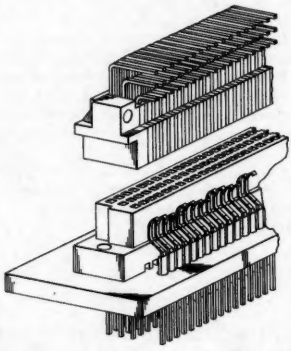
CONNECTOR ASSEMBLY

William A. Northey, Etters, and James R. Koser, Elizabeth, both of Pa., assignors to Berg Technologies, Inc., Reno, Nev.

Continuation of Ser. No. 149,475, Nov. 9, 1993, Pat. No. 5,403,196. This application Apr. 3, 1995, Ser. No. 415,189

Int. Cl.[6] H01R *13/648*

U.S. Cl. 439—108 **4 Claims**



1. A receptacle for mating with a pin header, comprising:

(a) an insulative body comprising an outer surface;

(b) a plurality of contact pins extending through said insulative body;

(c) a plurality of enhancement contacts disposed externally to said insulative body; and

(d) a board structure holding said insulative body and enhancement contacts in a fixed position relative to each other;

wherein at least two of said enhancement contacts are of unequal lengths, whereby, when said pin header is mated with said receptacle, said at least two enhancement contacts make contact with corresponding terminals of said pin header at different times.

5,486,116

PLUG AND SOCKET CONNECTION SYSTEM FOR AN ELECTRONIC UNIT

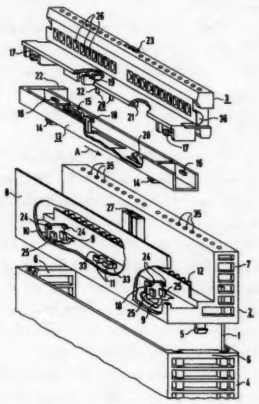
Werner Meiler, Ebermannsdorf, and Günther Deinhardt, Amberg, both of, Germany, assignors to Siemens Aktiengelsellschaft, München, Germany

Filed Oct. 12, 1993, Ser. No. 135,612

Claims priority, application European Pat. Off., Jan. 14, 1992, 92117567

Int. Cl.[6] H01R *4/50*

U.S. Cl. 439—347 **16 Claims**



1. A plug and socket connection system comprising:

a) a connection plug for the coupling of a plurality of connecting lines, said connection plug having a first linear guiding element and a first locking element; and

b) a socket for mating with said connection plug, said socket having a second linear guiding element, and having a second locking element, wherein said first and second guiding elements cooperate to guide the connection plug and the socket into a correct position when mating the connection plug and the socket, the first and second locking elements permit the connection plug to be detachably locked in the socket, and the first and second locking elements cooperate by engaging in at least two positions;

wherein the connection plug is isolated electrically from the socket in one of the engaged positions.

5,486,117

LOCKING SYSTEM FOR AN ELECTRICAL CONNECTOR ASSEMBLY

Wei-Sun Chang, Taipei, Taiwan, Prov. of China, assignor to Molex Incorporated, Lisle, Ill.

Filed Aug. 9, 1994, Ser. No. 287,987

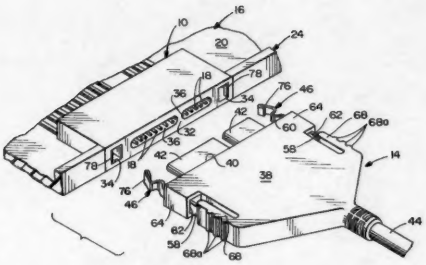
Int. Cl.[6] H01R *13/627*

U.S. Cl. 439—357 **9 Claims**

1. A locking system for an electrical connector assembly, comprising:

a first electrical connector including a housing having a mating face and a latching surface facing in a direction generally opposite said mating face; and

a second electrical connector including a housing having a complementary mating face for interfacing with the mating face of the first connector and a metal spring latch arm cantilevered from a rearward portion of the second connector with a radiused hook portion for latchingly engaging the latching surface of the first connector, the latch arm being located for manual deflection to move said hook portion out of engagement with the latch shoulder to allow unmating of the connectors with a minimal force, and the hook portion



intersecting the latching surface along a radius to produce a lateral force for deflecting the latch arm in response to an unmating force applied directly to the connectors that is greater than said minimal force.

5,486,118

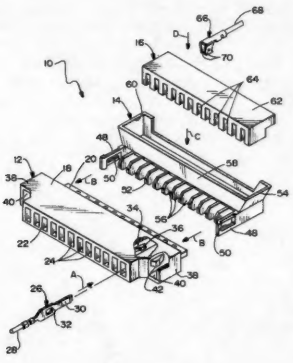
ELECTRICAL CONNECTOR WITH TERMINAL POSITION ASSURANCE DEVICE AND GUIDE MEANS FOR A MATING CONNECTOR

Stephen A. Colleran, Lisle; Jeffrey J. Pawlicki, Downers Grove, and John O. Higgins, Jr., Berwyn, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Oct. 3, 1994, Ser. No. 316,785

Int. Cl.[6] H01R *13/436;13/629*

U.S. Cl. 439—374 **13 Claims**



1. An electrical connector assembly, comprising:

a housing having a forward mating end and a rearward terminating end and a plurality of terminal-receiving cavities extending therebetween;

a plurality of terminals received in said cavities; and

a TPA device selectively engageable with the housing at said mating end thereof, the TPA device having guide means for guiding a complementary connecting device into mating engagement with the mating end of the connector housing; and

wherein said guide means comprises a funnel-type structure defining a relatively wide mouth to receive and guide the complementary connecting device into mating engagement with the mating end of the connector housing.

5,486,119

MATABLE CONNECTOR

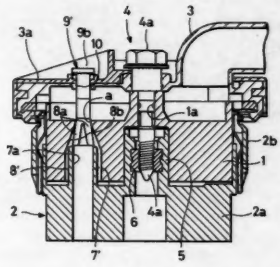
Akira Nabeshima; Kaoru Watanabe, and Toshikazu Saba, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Feb. 18, 1994, Ser. No. 198,282

Claims priority, application Japan, Mar. 19, 1993, 5-018644 U; Mar. 19, 1993, 5-018645 U; Mar. 19, 1993, 5-018646 U

Int. Cl.[6] H01R *3/00*

U.S. Cl. 439—489 **7 Claims**



1. A connector wherein a first connector housing and a second connector housing are displaced relative to each other in a connecting direction so that said first and second connector housings can be fitted together, the connector further comprising:

a pin insertion aperture formed in said first connector housing and having opposite open ends;

a fitting detection pin having a resiliently inwardly-deformable insertion piece at a distal end thereof, said detection pin being inserted into said pin insertion aperture from one end of said pin insertion aperture; and

a projection portion formed on said second connector housing, said projection portion being inserted into said pin insertion aperture from the other end thereof in accordance with the displacement of said first and second connector housings in the connecting direction, said projection pin retaining said fitting detection pin at a distal end thereof to urge said detection pin toward the one end of said pin insertion aperture,

wherein when said fitting detection pin is urged by said projection portion, said insertion piece is gradually resiliently deformed inwardly, in a fitting-uncompleted condition of said first and second connector housings, said fitting detection pin is retained from further insertion by said projection portion, and in a fitting-completed condition of said two connector housings, the amount of deformation of the insertion piece is large, so that the retaining thereof by said projection portion is released, and therefore said fitting detection pin can be inserted within the distal end of said projection portion.

5,486,120

COAXIAL CABLE CONNECTION PROTECTION SYSTEM WITH MULTIPLE CHAMBERED, FLEXIBLE-WEBBED SHROUD

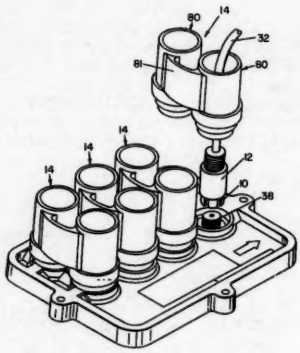
Corey McMills, Los Altos; John Mattis, Sunnyvale, both of Calif., and Dieter Fremgen, Wulfrath, Germany, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 911,427, Jul. 10, 1992, Pat. No. 5,277,598. This application Aug. 13, 1993, Ser. No. 106,276

Int. Cl.[6] H01R *14/639;17/04*

U.S. Cl. 439—521 **9 Claims**

1. A system for protectively connecting a plurality of coaxial cable termini to standard coaxial cable connection jacks, wherein each connection jack comprises (1) an externally threaded body with a connection jack aperture, and (2) an internal electrical



conductor disposed within, but insulated from, the body proximate to the connection jack aperture, the system comprising:

a. an electrically conductive connection jack connector comprising a connection jack attachment moiety and a cable attachment moiety, the connection jack attachment moiety having a collet structure with a base, a base aperture and a plurality of flared fingers, and the cable attachment moiety having an open ended hollow cylinder which communicates with the collet base aperture, wherein the connection jack attachment moiety is attached tightly around the threaded body of the connection jack and the cable attachment moiety is attached to the coaxial cable terminus in such a way that the cable attachment moiety is in electrical contact with the concentric conductor and in such a way that the central conductor protrudes axially through the collet base aperture, through the connection jack aperture, and is in electrical contact with the internal electrical conductor;

b. a hollow, open-ended swagging shell comprising a compression moiety and a retraction moiety, the compression moiety being disposed tightly over the flared fingers of the connection jack connector thereby applying hoop stress to the flared fingers so as to urge the flared fingers into tight connection with the threaded body of the connection jack; and

c. a hollow locking shroud having elongated side walls which define a plurality of locking shroud chambers each with an open end, each locking chamber being attached to one other locking shroud chamber by a flexible web disposed in a curved plane, the locking shroud being disposed in such a way that the side walls can surround each connection jack, connection jack connector and swagging shell.

5,486,121

ELECTRICAL CONNECTOR ASSEMBLY

Vernon R. Miller, Atlanta, Ga., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jul. 7, 1994, Ser. No. 271,683

Int. Cl.[6] H01R *25/00*

U.S. Cl. 439—652 **22 Claims**

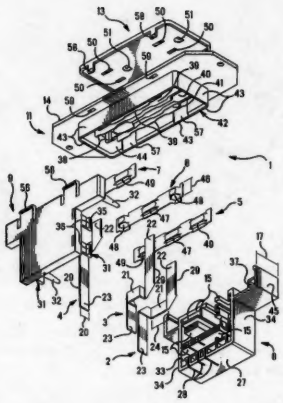
1. A connector assembly comprising:

a socket subassembly removably attached to a distribution subassembly in predetermined interposition;

said distribution subassembly including a bus housing accommodating and retaining distribution blade buses in respective predetermined pathways, and a bus housing cover secured to the bus housing and providing means for further supporting and retaining said distribution blade buses within the bus housing;

said socket subassembly including a socket housing retaining socket buses in predetermined positions;

each of said distribution blade buses comprising an integral metal bus strip having a substantial uniform width, each of said bus strips includes a connection end and a terminal end,



respectively, at least one said bus strip being folded across its width to define first and second portions on respective sides of said fold extending to respective ones of said connection and terminal ends, the first and second portions extending in different directions complementary to a said respective predetermined pathway for said bus strip in the bus housing; and

each of said socket buses comprising an integral metal socket strip, respectively, each socket strip having a respective first opening for receiving the connection end of the respective bus strip, thereby providing electrical connection of each socket bus to the respective distribution blade bus.

5,486,122

BOLT-TIGHTENED CONNECTOR

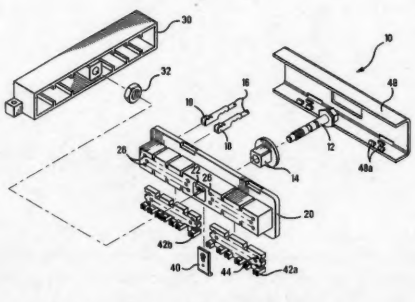
Kenzo Oda, Hatano, and Shinji Amemiya, Kanagawa, both of, Japan, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jul. 21, 1993, Ser. No. 95,384

Claims priority, application Japan, Aug. 21, 1992, 4-058841 U

Int. Cl.[6] H01R *13/514*

U.S. Cl. 439—752 **34 Claims**



1. An electrical connector half comprising:

a plug housing having apertures for receiving contacts, and which is matable to a cap housing;

the plug housing includes at least one opening for receiving a two-position double-lock member, the opening including at least one projection for engaging and retaining the double-lock member in a tentatively latched first position or a fully latched second position; and

the cap housing is fitted to the plug housing by the cap housing covering the double-lock member when the double-lock member is in the fully latched second position wherein the

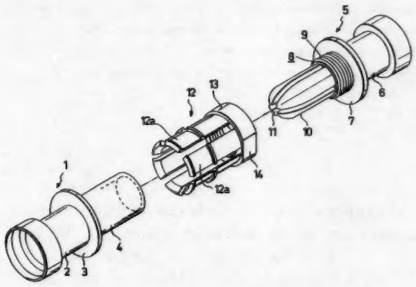
double-lock member includes a resiliently deflectable latching arm which deflects in response to engaging said at least one projection as the double-lock member is moved to said first position.

5,486,123

CONNECTOR TERMINAL

Sho Miyazaki, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Mar. 9, 1994, Ser. No. 207,675
Claims priority, application Japan, Mar. 18, 1993, 5-085784
Int. Cl.[6] H01R *13/05*
U.S. Cl. 439—825 **10 Claims**



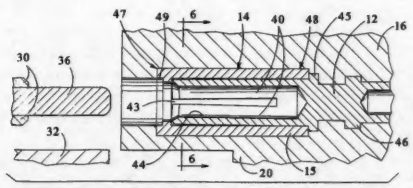
1. A connector terminal comprising a first terminal having a cylindrical tubular portion, and a second terminal that can be fitted in said tubular portion, wherein an outer terminal member and an inner terminal member for contacting respectively with outer and inner surfaces of said tubular portion are attached to said second terminal in coaxial relation, said outer terminal member being displaced radially from the axis of said cylindrical tubular portion and radially displaced and separated throughout from said inner terminal member when attached to said second terminal, and said outer terminal member being selectively removable from said second terminal without deformation of said outer terminal member or any portion of said second terminal.

5,486,124

RIGID PLASTIC HOOD FOR SOCKET CONTACTS

David Wandler, Lockport, Ill., assignor to Methode Electronics, Inc., Chicago, Ill.

Filed Aug. 4, 1994, Ser. No. 285,900
Int. Cl.[6] H01R *13/187*
U.S. Cl. 439—843 **12 Claims**



1. A socket contact assembly for mating with a male contact pin, said socket contact assembly comprising:

(a) an elongated socket contact of resilient conductive material and having a forward male contact pin mating end and a rearward end, said forward end including a plurality of semi-circularly shaped fingers extending from said socket contact and forming a bore having an inner diameter; and

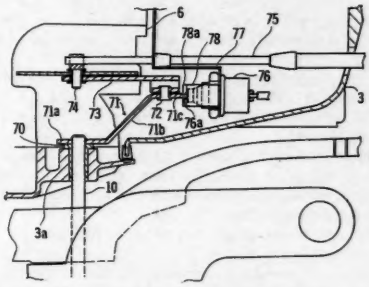
(b) a rigid cylindrical hood disposed over the fingers and having a first end and a second end, said first end having a flash ring adjacent thereto with an opening adapted to allow insertion of said male contact pin, and said second end press-fit mounted onto said socket contact and causing said diameter of said bore to be bounded and to decrease at said forward male contact pin mating end.

5,486,125

DRIVE TRANSMISSION SYSTEM FOR VESSEL PROPELLING EQUIPMENT

Chiharu Soda; Yasushi Fujita; Yoshihiko Fukuda, and Kaoru Ichihashi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1994, Ser. No. 247,980
Claims priority, application Japan, May 25, 1993, 5-144430; Jun. 3, 1993, 5-034884 U; Jun. 3, 1993, 5-034885 U; Jun. 3, 1993, 5-156332
Int. Cl.[6] B63H *20/20*
U.S. Cl. 440—75 **9 Claims**



1. A drive transmission system for a vessel propelling equipment in which a propeller shaft having a propeller on one end is rotatably supported within a gear case; a pair of gears including an ahead gear and an astern gear which rotate in opposite directions are rotatably supported on said propeller shaft; and a clutch gear slidably supported on said propeller shaft and rotating together with said propeller shaft is clutch coupled to either one of said pair of gears, thereby turning said propeller normally or reversely to propel a vessel ahead or astern; said drive transmission system, comprising:

a shift slider axially slidable within said propeller shaft to move said clutch gear through a clutch shifter pin inserted through said propeller shaft; and

an operating member capable of operating said shift slider from above said gear case;

said operating member including:

a shift fork engaged with a fork engaging portion of said shift slider for moving said shift slider;

a guide member supporting said shift fork and movable in a specific direction;

a rotatable rod member engaged with a rod engaging portion of said shift fork for moving said shift fork in response to rotation of said rotatable rod member; and

a support member drivably supporting said rod member and fixedly supporting said guide member, thereby sub-assembling said rod member and said guide member for transmitting the operation of said rod member to said shift fork;

said support member being fitted in a fitting portion of said gear case from above.

5. A drive transmission system for a vessel propelling equipment in which a propeller shaft having a propeller on one end is rotatably supported within a gear case; a pair of gears including an ahead gear and an astern gear which rotate in opposite directions are rotatably supported on said propeller shaft; and a clutch gear

slidably supported on said propeller shaft and rotating together with said propeller shaft is clutch coupled to either one of said pair of gears, thereby turning said propeller normally or reversely to propel a vessel ahead or astern; said drive transmission system, comprising:

a shift rod rotatable about its axis for moving said clutch gear through a transmission mechanism for clutching motion;

a shift arm having a base end portion fitted on said shift rod so as to rotate integrally with said shift rod; and

a neutral switch composed of a limit switch for detecting a neutral state;

said neutral switch positioning said shift arm at a neutral position of said shift arm by disengageably engaging with said shift arm to detain said shift arm.

6. A vessel propelling equipment having an engine with a vertical output shaft, a drive gear integrally connected to said output shaft, front and rear driven gears each engaged with said drive gear, and a clutch gear fitted on a propeller shaft by splines, said clutch gear sliding back and forth along said propeller shaft and engaging with either of said driven gears to rotate a propeller in a normal or reverse direction for forward or backward motion of the vessel, comprising:

a clutch shifter pin engaging with said clutch gear;

an outer shift slider axially slidably put within said propeller shaft and having an elongate hole which said clutch shifter pin penetrates through having some surplus spaces at before and behind;

an inner shift slider axially slidably put within said outer shift slider and having an elongate hole which said clutch shifter pin penetrates through having some surplus spaces at before and behind;

a spring interposed between said outer and inner shift sliders;

a shift fork moving back and forth to give a force and move either of said inner and outer shaft sliders according to the moving direction; and

positioning means for positioning said clutch gear at a neutral position.

7. A vessel propelling equipment having an engine with a vertical output shaft, a drive gear integrally connected to said output shaft, front and rear driven gears each engaged with said drive gear, and a clutch gear fitted on a propeller shaft by splines, said clutch gear sliding back and forth along said propeller shaft and engaging with either of said driven gears to rotate a propeller in a normal or reverse direction for forward or backward motion of the vessel, comprising:

a shaft holder provided in a casing of said vessel propelling equipment for supporting said propeller shaft rotatably;

a bearing provided on a cylindrical portion of one of said driven gears extending along said propeller shaft;

a circular ring-shaped bearing holder having a T-shaped section interposed between an outer periphery of said bearing and an inner periphery of said shaft holder, in a state that a front surface and outer peripheral surface of an outer race of said bearing are fittedly supported by said bearing holder; and

a flange portion of said propeller shaft abutting against a rear side surface of an inner race of said bearing;

said bearing holder having a front side surface abutting against a shoulder portion formed on an inner surface of said casing so that a thrust force of said propeller shaft is transmitted to said casing by means of said bearing and said bearing holder.

5,486,126

SPACERS FOR LARGE AREA DISPLAYS

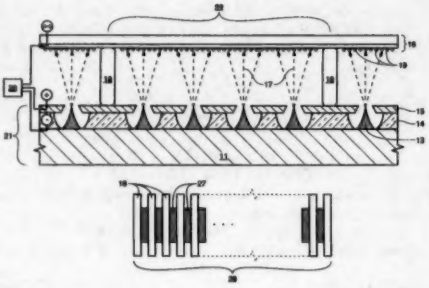
David A. Cathey; James J. Hofmann; Danny Dynka, and Daryl M. Stansbury, all of Boise, Id., assignors to Micron Display Technology, Inc., Boise, Id.

Filed Nov. 18, 1994, Ser. No. 349,091

Int. Cl.[6] H01J *9/18*

U.S. Cl. 445—25 **28 Claims**

1. A process for forming spacers, useful in large area displays, said process comprising the following steps of:



forming bundles comprising fiber strands, said fiber strands being held together with a binder;

slicing said bundles into slices;

placing said slices on a plate of the display; and

removing said binder.

5,486,127

CONFIGURED OR KEYED CONNECTOR SYSTEM

Michael Wolfe, 101 W. 90th St., New York, N.Y. 10024

Filed Dec. 30, 1994, Ser. No. 366,832

Int. Cl.[6] A63H *33/06;3/16;* **A41F** *1/00;* **A43C** *11/00*

U.S. Cl. 446—120 **6 Claims**

1. A system for coupling components comprising:

(a) a first component part with a male connector extending therefrom, the male connector comprising:

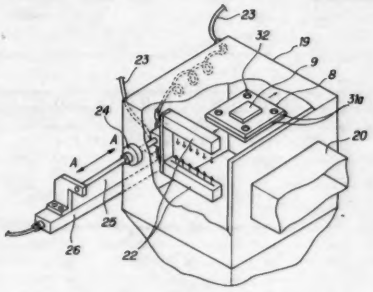
(i) a button head connector with a circular end having a diameter, a shaft, having a diameter and an axis, connecting the button head end to the component part, with the circular end having a larger diameter than the attaching shaft, and

(ii) at least one key adjoining and extending radially outwardly from at least one of the button head end, the shaft, and the component part; and

(b) a second component part with a female receptor integrally formed in the second component part having a central opening surrounded by scalloped edges between which are configured at least one positioning slot, the positioning slot(s) radiating from the central opening to receive said key(s) as the male button head connector is engaged in the female receptor.

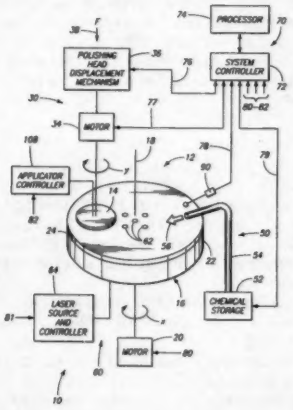
wherein the key of the male connector when the male connector is engaged with the female receptor restrains rotational movement about the axis of the male and female connectors.

5,486,128
POWDER BEAM ETCHING MACHINE
Takashi Tsuchiya, Tokyo, and Osamu Ishii, Kanagawa, both of, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 18, 1993, Ser. No. 137,516
Claims priority, application Japan, Jan. 30, 1992, 4-316582
Int. Cl.[6] B24C *3/00*
U.S. Cl. 451—2 **3 Claims**



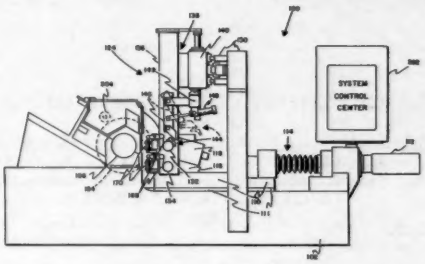
1. A powder beam etching machine comprising:
an injection chamber for etching a work laid on a support member by injecting powders to the work, said support member having at least one side which is sloped relative to a surface of said support member on which the work is laid;
a cleaning chamber for cleaning the work which has been etched, by air toward said support member in a direction substantially perpendicular to the surface thereof;
wherein the air is directed toward the at least one sloped side of said support member at an acute angle.

5,486,129
SYSTEM AND METHOD FOR REAL-TIME CONTROL OF SEMICONDUCTOR A WAFER POLISHING, AND A POLISHING HEAD
Gurtej S. Sandhu, and Trung T. Doan, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Aug. 25, 1993, Ser. No. 112,759
Int. Cl.[6] B24B *49/00*
U.S. Cl. 451—5 **41 Claims**



28. A method for polishing a semiconductor wafer comprising the following steps:
providing a wafer polishing assembly for polishing a face of a semiconductor wafer at a polishing rate and a polishing uniformity, the wafer polishing assembly including a platen subassembly rotatable about a first axis, a polishing head which supports the semiconductor wafer for rotation about a second axis, and a polishing head displacement mechanism which moves the polishing head and wafer across the platen subassembly at an adjustable rate;
using the wafer polishing assembly to polish a face of a semiconductor wafer at a polishing rate and a polishing uniformity according to a set of controllable operational parameters that upon variation change the polishing rate and polishing uniformity;
monitoring in situ at least one of the operational parameters of the wafer polishing assembly;
determining a set of desired operational parameters based upon the monitored operational parameters and outputting control information indicative of the desired operational parameters; and
adjusting in situ at least one of the operational parameters in response to the control information to effectuate a new polishing rate and a new polishing uniformity and then continuing polishing of the semiconductor wafer face according to the new polishing rate and new polishing uniformity.

5,486,130
METHOD AND APPARATUS FOR SIMULTANEOUSLY GRINDING MULTIPLE SLEEVES
Mark C. Kilmer, Sr., Southgate, Ky., assignor to Goldcrown Machinery, Inc., Cincinnati, Ohio
Filed Sep. 6, 1994, Ser. No. 301,359
Int. Cl.[6] B24B *29/00*
U.S. Cl. 451—11 **21 Claims**



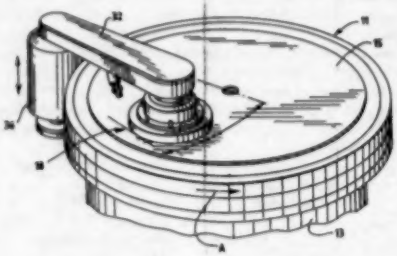
1. A grinding system for simultaneously grinding multiple sleeves in a single grinding operation, said grinding system comprising:
a fixed machine bed;
a grinding wheel mounted upon said fixed machine bed for controlled rotation about a fixed axis defined by bearings at each end of said wheel, said grinding wheel being sufficiently wide to simultaneously grind all of said multiple sleeves with said multiple sleeves being axially aligned;
a friction bearing slide mounted upon said machine bed for movement toward and away from said grinding wheel in a direction generally perpendicular to said fixed axis;
a headstock mounted to said slide;
a grinding arbor having a proximal end mounted to said headstock to cantilever support said grinding arbor and a distal end, said grinding arbor supporting multiple sleeves thereon with axes of said multiple sleeves being collinear along said grinding arbor and parallel to the fixed axis of said grinding wheel;
a retractable steady rest for engaging the distal end of said grinding arbor during grinding operations; and
a servo drive connected between said machine bed and said friction bearing slide for moving said slide upon said machine bed toward and away from said grinding wheel.

5,486,131

DEVICE FOR CONDITIONING POLISHING PADS

Joseph V. Cesna, Niles, Ill., and Anthony G. Van Woerkom, Gilbert, Ariz., assignors to Speedfam Corporation, Des Plaines, Ill.

Filed Jan. 4, 1994, Ser. No. 177,156
Int. Cl.[6] B24B *1/00*
U.S. Cl. 451—56 **10 Claims**



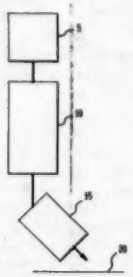
1. A process for simultaneously truing and dressing a polishing pad covering a platen mounted on a polishing machine for rotation about a vertical axis which comprises while said polishing pad is being rotated bringing under pressure into contact with the top exposed surface of said polishing pad and oscillating over the said pad surface a carrier element adapted for vertical movement into and out of substantially perpendicular engagement with the surface of a polishing pad and for oscillating radial movement over the surface of the polishing pad, said carrier element being in the shape of a ring and carrying on its bottom surface cutting means disposed in a circular ring configuration for truing and dressing the polishing pad by contact therewith.

5,486,132

MOUNTING APPARATUS FOR CRYOGENIC AEROSOL CLEANING

William A. Cavaliere, Verbank; Robert P. Kuder, II, Hopewell Junction, and Jin J. Wu, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 14, 1993, Ser. No. 76,065
Int. Cl.[6] B24C *3/00*
U.S. Cl. 451—75 **20 Claims**



1. An apparatus for mounting to a tool which has a surface to be cleaned, and for producing aerosol from a substance for cleaning the surface, comprising:

a flange for mounting to a tool having a surface to be cleaned;

a nozzle mounted to said flange for receiving a substance, said nozzle having at least one exit opening which allows passing of the substance therethrough for expanding the substance from a first pressure to a second pressure which is lower than the first pressure for solidifying at least a substantial portion of the substance and producing aerosol for cleaning the surface;

maneuvering means comprising a swivel-type joint connected to said nozzle for allowing maneuvering of said nozzle during cleaning of said tool;

condensation preventing means for preventing condensation from forming on surfaces of the apparatus and the surface to be cleaned; and

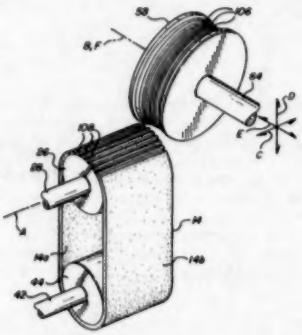
contamination preventing means for preventing contaminants from re-contaminating the surface subsequent to removal therefrom.

5,486,133

TIMING BELT GRINDING APPARATUS AND METHOD

Jerry Russell, 95 Windsor Rd., Rochester, Mich. 48307

Filed May 31, 1994, Ser. No. 251,024
Int. Cl.[6] B24B *7/00*
U.S. Cl. 451—150 **26 Claims**



1. Apparatus for cutting teeth into an endless belt blank (**14**) of predetermined width to produce a timing belt (**12**), said apparatus comprising:

belt support means (**24**, **24'**) for supporting the endless belt blank (**14**) for selective rotation about a first axis (A);

a cutting wheel (**58**, **58'**) having a plurality of peripheral tooth cutting portions (**106**, **106'**) spaced laterally from one another;

and characterized by wheel rotation means (**60**) for rotating said wheel (**58**, **58'**) about a second axis (B) transverse to said first axis (A) and translating means (**66**) for translating said wheel (**58**, **58'**) relative to said belt support means (**24**, **24'**) across the width of the belt blank (**14**) along a path generally parallel to said first axis (A) for cutting a plurality of transverse teeth (**108**) into the belt blank (**14**) with said tooth cutting portions (**106**, **106'**).

5,486,134

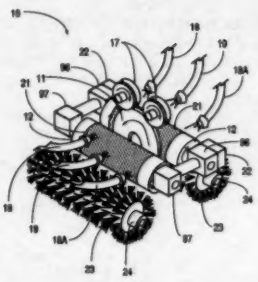
SYSTEM AND METHOD FOR TEXTURING MAGNETIC DATA STORAGE DISKS

Oliver D. Jones, Santa Cruz, and Donald E. Stephens, Westlake Village, both of Calif., assignors to Oliver Design, Inc., Scotts Valley, Calif.

Filed Feb. 27, 1992, Ser. No. 842,695
Int. Cl.[6] B24B *29/02*
U.S. Cl. 451—209 **29 Claims**

1. A unit for texturing a data storage disk, said unit comprising:

a pair of cylindrical members oriented such that their axes are substantially parallel, said members being capable of sandwiching a data storage disk between them such that the area of contact between each of said cylindrical members and a surface of a disk extends between first and second segments of an outside edge of said disk, the surface of each of said members being designed to support an abrasive material;



a first drive mechanism for rotating said cylindrical members in opposite directions so as to impose, by means of said abrasive material, a frictional force on the surfaces of said disk;

a second drive mechanism for rotating said disk, said second drive mechanism being designed to operate by applying a tangential force to the outside edge of said disk.

5,486,135

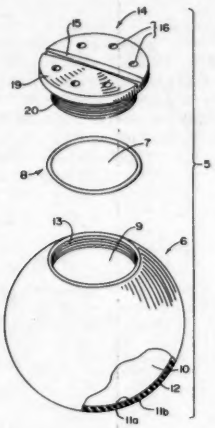
VIBRATORY TUMBLING MACHINE VESSEL FOR BURNISHING OR CLEANSING METAL, PLASTIC OR CERAMIC ELEMENTS

Jerry Arpaio, 72 Heller Hill Rd., Blairstown, N.J. 07825

Filed Oct. 31, 1994, Ser. No. 332,141

Int. Cl.[6] B24B *31/00*

U.S. Cl. 451—326 **34 Claims**



1. A vibratory vessel for use conjunction with a vibratory tumbling machine utilizing a burnishing or cleansing media, for burnishing or cleansing metal, plastic and ceramic elements comprising in combination: a substantially globe-forming structure having a substantially globally-shaped exterior surface and having an inner wall surface forming a globally-shaped inner space separate and apart from outer space exterior to said globe-forming structure, said substantially globe-forming structure having at-least one female closure opening-forming structure forming at-least one female closure-opening therein, said substantially globe-forming structure being wall structure of at least one of a plastic; and at-least one male closure member of a shape effective to sealably close said female closure-opening, said at-least one female closure opening-forming structure and said at-least one closure member being jointly and coordinately structured such that said at-least one of said female closure opening-forming structure is intermittently mountable within said at-least one female closure-opening, said substantially continuous wall structure being retainable of at-least one of metal, plastic and ceramic elements within said globally-shaped inner space, said female closure-opening being of a first predetermined size sufficiently large for passage therethrough at-least one of metal, plastic and ceramic elements within said globally-shaped inner space, said substantially continuous wall structure includes a plurality of small aperture extending between and through said substantially globally-shaped exterior surface and having an inner wall surface, each of said plurality of small apertures being of a predetermined maximum size sufficiently small to retain at-least one of metal, plastic and ceramic elements within said globally-shaped inner space.

5,486,136

CUTTING MACHINE FOR RAILROAD RAIL

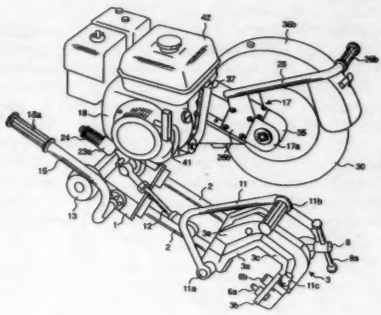
Hirotoshi Noda, Kanagawa, Japan, assignor to Kabushiki Kaisha Yamazaki Haguruma Seisakusho, Kanagawa, Japan

Continuation of Ser. No. 119,237, Sep. 24, 1993, abandoned. This application May 26, 1995, Ser. No. 451,383

Claims priority, application Japan, Jun. 15, 1992, 4-180419

Int. Cl.[6] B24B *23/00;27/08*

U.S. Cl. 451—347 **5 Claims**



1. A cutting machine for cutting railroad rails comprising:

clamping means for clamping a railroad rail from both transverse sides of said railroad rail;

a pair of juxtaposed guide rods secured to and extending in parallel from said clamping means, said guide rods being brought into horizontal and perpendicular placement relating to a lengthwise direction of said railroad rail when said clamping means clamps said railroad rail;

a main body mounted for slide movement on said juxtaposed guide rods;

a cutting arm having a support bracket defined at a first end thereof, pivotally mounted on said main body;

an engine supported on said support bracket and secured to said main body by said support bracket;

a grinding disk saw supported at a second end of said cutting arm;

means for operationally coupling said grinding disk saw to said engine;

a stroke handle pivotally connected to said clamping means; and

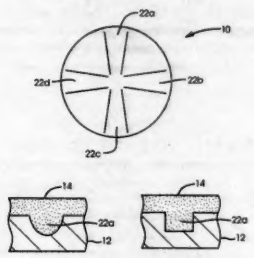
connecting means, pivotally connected at one end to said main body and at another end to said stroke handle, for transferring movement of said stroke handle to said main body to produce said slide movement;

said slide movement bringing said grinding disk saw into and out of engagement with said railroad rail.

5,486,137
ABRASIVE TOOL INSERT

Gary M. Flood, Canal Winchester; David M. Johnson, Westerville, and Henry S. Marek, Worthington, all of Ohio, assignors to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 105,523, Aug. 11, 1993, and a continuation-in-part of Ser. No. 95,631, Jul. 21, 1993. This application Jul. 6, 1994, Ser. No. 271,307
Int. Cl.[6] E21B *10/46*
U.S. Cl. 451—540 5 Claims



1. An abrasive tool insert comprising:

a substrate having an end face,

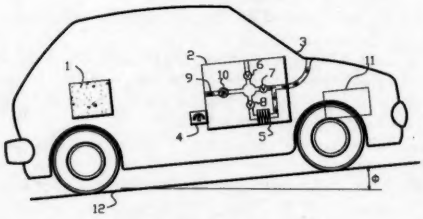
a continuous abrasive layer having a center, a periphery forming a cutting surface, an upper surface and a lower surface integrally formed on said end face of said substrate and defining an interface there between, said lower surface of said abrasive layer having at least one protrusion extending from said interface into the substrate and from said center to said periphery, said end face of said substrate having at least one slot for receiving said protrusion of said abrasive layer,

wherein said interface includes at least one region extending from said cutting surface such that said abrasive layer is thicker at said cutting surface than at regions immediately and radially interior to said cutting surface.

5,486,138
AIR-POLLUTION REDUCTION METHOD AND SYSTEM FOR THE INTERIOR OF AN AUTOMOBILE

Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

Filed Jul. 20, 1994, Ser. No. 277,963
Int. Cl.[6] B60H *3/06*
U.S. Cl. 454—75 20 Claims

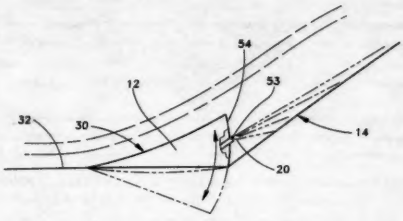


1. A method of reducing the level of air pollution in the interior of a vehicle having a controllable air intake system leading to said interior of the vehicle, comprising the steps of (a) detecting the physical inclination of the vehicle or a change of such physical inclination and (b) controlling air intake to said interior of the vehicle in response to such detection.

5,486,139
EXTERIOR WINDSHIELD SURFACE BLOWER

George W. Papp, 537 Spring Lake Dr., Melbourne, Fla. 32940

Filed Oct. 25, 1993, Ser. No. 140,563
Int. Cl.[6] B60S *1/54*
U.S. Cl. 454—123 14 Claims



1. An exterior windshield surface blower system, disposed on a vehicle, to direct a flow of air at a windshield of the vehicle to remove rain and snow therefrom, said system comprising:

(a) an air deflector disposed along a lower edge of said exterior windshield surface, having an upper surface and having a generally vertical face in proximity with the exterior windshield surface;

(b) an air directing means disposed in said face so as to direct forced air against said windshield;

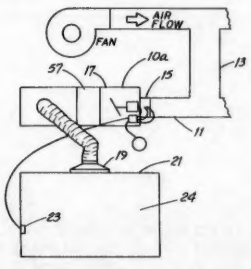
(c) said air directing means comprises a plurality of fan spray jets; and

(d) an air supply means to supply forced air to said air directing means.

5,486,140
VARIABLE AIR VOLUME TERMINAL UNIT WITH EXTERIOR INSULATION

Thomas A. Abbott, Apex, N.C.; Stephen E. Cooley, and Michael S. MacDonald, both of Madison, Wis., assignors to Venturedyne, Ltd., Milwaukee, Wis.

Filed Oct. 21, 1993, Ser. No. 139,092
Int. Cl.[6] F24F *7/00*
U.S. Cl. 454—333 11 Claims



1. A method for applying insulation to a variable air volume terminal unit having (a) an actuator coupled to a damper for controlling the volume of air flowing through the unit, and (b) a compartment with plural compartment surfaces, the method including the steps of:

forming a plurality of insulating components; and,

securing a separate component to each of at least two compartment surfaces,

and wherein:

the securing step includes applying a ribbon of flat flexible securing material to the insulating components, thereby retaining such components against the compartment surfaces.

5,486,141

AMUSEMENT MACHINE AND RECORDING MEDIUM FOR USE IN THE SAME

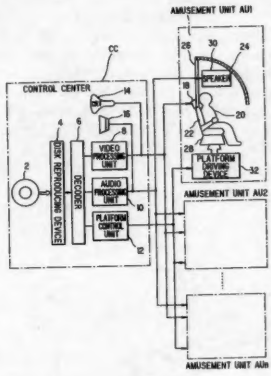
Norio Ohga, Tokyo, and Koichi Takeuchi, Kanagawa, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1993, Ser. No. 124,009

Claims priority, application Japan, Sep. 22, 1992, 4-278000; May 14, 1993, 5-112537

Int. Cl.[6] A63G *31/16*

U.S. Cl. 472—60 11 Claims



1. An amusement machine for displaying a picture to a user and allowing the user to be bodily sensate to a provided motion, including:

a display for displaying the picture to the user, the display including a screen positioned in front of the user and a projector positioned on a front side of the screen whereat the user is located and in line-of-sight communication with the screen;

support means for supporting the user, the screen being fixedly connected to said support means;

motion providing means for moving the support means and the screen and for providing the user with a sense of bodily motion;

a disk-shaped recording medium on which a video signal representing the picture displayed on said display and a control signal for controlling said motion providing means are recorded; and

means for reproducing the video signal and the control signal from said disk-shaped recording medium and for controlling said display and said motion providing means, wherein both of the video signal and the control signal associated with the video signal are recorded as code information on the disk-shaped recording medium, the video signal and the control signal being arranged in frames so as to be synchronized with each other upon reproducing,

wherein said disk-shaped recording medium has a first annular area on which a control signal for controlling said motion providing means is continuously recorded and a second annular area on which a signal representing the picture is continuously recorded, and wherein said means for reproducing and controlling includes storing means for storing the control signal reproduced from the first annular area and synchronizing means for outputting the control signal from said storing means in synchronism with the signal representing the picture reproduced from the second annular area.

5,486,142

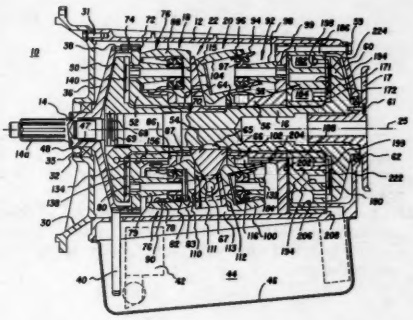
HYDROSTATIC TRANSMISSION INCLUDING A SIMPLIFIED RATIO CONTROLLER

Lawrence R. Folsom, Pittsfield, Mass., assignor to Martin Marietta Corporation, King of Prussia, Pa.

Filed Nov. 21, 1994, Ser. No. 342,472

Int. Cl.[6] F16H *61/00;* F16D *31/02*

U.S. Cl. 474—69 20 Claims



1. A continuously variable hydrostatic transmission comprising, in combination:

a housing;

an input shaft journaled in the housing to receive torque from a prime mover;

a pump unit including a first carrier driven by the input shaft and mounting an annular array of pump pistons, and a first cylinder block providing an annular array of pump cylinders for respectively receiving the pump pistons;

a motor unit including a second carrier fixed to the housing and mounting an annular array of motor pistons, and a second cylinder block providing an annular array of motor cylinders for respectively receiving the motor pistons;

an output shaft journaled in the housing and adapted for driving connection to a load;

an annular swashplate surrounding the output shaft and having an input face and an output face arranged at an acute angle relative to each other, the input face confronting the first cylinder block and the output face confronting the second cylinder block, the swashplate further including slots accommodating pumped fluid flow between the pump cylinders and the motor cylinders through openings in the first and second cylinder blocks;

a connector pivotally coupling the swashplate to the output shaft in torque-coupled relation; and

a ratio controller selectively exerting coordinated axial forces on the first and second cylinder blocks to adjustably set an angle of the swashplate relative to an axis of the output shaft according to a desired speed ratio between the input and output shafts.

5,486,143

BELT DRIVE TRANSMISSION

David C. Ashby, 610 Fox Valley Dr., Longwood, Fla. 32779

Filed Aug. 12, 1992, Ser. No. 928,450

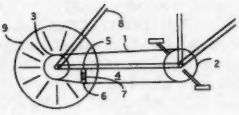
The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.

Int. Cl.[6] F16H *7/00;55/00*

U.S. Cl. 474—148 12 Claims

1. A bicycle transmission comprising:

a belt communicating with a first gear and a second gear, said communication being substantially on a circumferential surface of said first gear and said second gear;



said first gear having first angled means for frictionally communicating with said belt and for urging said belt against a first gear wall adjacent to the circumferential surface of said first gear; and

said second gear having second angled means for frictionally communicating with said belt and for urging said belt against a second gear wall adjacent to the circumferential surface of said second gear.

5,486,144

COUPLING ARRANGEMENT

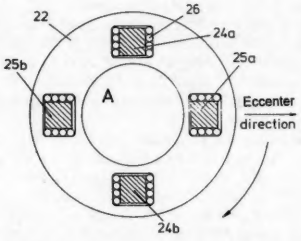
Gustav Rennerfelt, Nilstorpsvägen 53, Lidingö , Sweden

Filed Oct. 5, 1993, Ser. No. 131,599

Claims priority, application Sweden, Jan. 22, 1992, 9203101

Int. Cl.[6] F16H *1/32*

U.S. Cl. 475—179 **1 Claim**



1. A coupling mechanism for translating low rotational speed of a gearwheel around its center from a high planetary rotational speed about a first axis to a centric rotation about a second axis comprising:

a gearwheel which is mounted upon a first shaft;

a second shaft;

a plate which includes a first pair of wall apertures, and a second pair of wall apertures, disposed generally equidistantly on the plate;

a first pair of axially extending studs mounted on said gearwheel;

a first and second block each of which is journalled to a respective stud of said first pair of axially extending studs and is displaceable radially relative to said plate in a respective wall aperture of said first pair of wall apertures;

a second pair of axially extending studs mounted on said second shaft;

a third and fourth block each of which is journalled to a respective stud of said second pair of axially extending studs and is displaceable radially relative to said plate in a respective wall aperture of said second pair of wall apertures; and

a plurality of sets of cylindrically shaped rolling bodies, each set of cylindrically shaped rolling bodies of said plurality extending in a linear row and being positioned between a side surface of a respective block and a side surface of a corresponding wall aperture in which said respective block is displaceable radially relative to said plate; said cylindrically shaped rolling bodies having a diameter and a mutual diameter difference such as to obtain a high bias and a generally uniformly distributed load when the plate is subjected to a given torque-load deformation.

5,486,145

METHOD AND DEVICE FOR STUNNING AN ANIMAL FOR SLAUGHTER

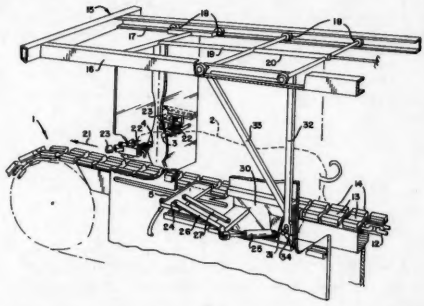
Wilhelmus A. Bernardus, Lichtenvoorde, and Hendrik J. Pardijs, Winterswijk, both of, Netherlands, assignors to Stork RMS B.V., Lichtenvoorde, Netherlands

Continuation of Ser. No. 33,185, Mar. 16, 1993, abandoned.

This application May 5, 1995, Ser. No. 435,172

Int. Cl.[6] A22B *3/06*

U.S. Cl. 452—58 **19 Claims**



1. A method for stunning an animal which has a head, a neck, and a main body, comprising the steps of:

a) providing the animal for slaughter on a conveyor;

b) moving the animal on the conveyor toward a destination;

c) causing a first current pulse to flow through the head and/or neck of the animal to stun the animal; and

d) causing a second current pulse to flow through the body of the animal to cause a cardiac arrest;

wherein step c) is carried out with an effective voltage of a maximum of 1000 volts and with the first current pulse having a maximum duration of 10 seconds;

wherein steps (c) and (d) are executed during step (b); and

wherein step (d) has a duration of a maximum of 10 seconds.

5,486,146

HYDRAULIC CONTROL CIRCUIT FOR AUTOMATIC TRANSMISSION

Norimi Asahara, Aichi; Kagenori Fukumura, Toyota; Yasuo Hojo, Nagoya, and Kazuhisa Ozaki, Aichi, all of, Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Sep. 7, 1994, Ser. No. 301,896

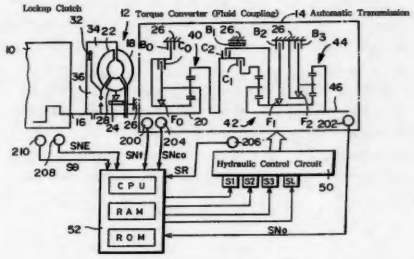
Claims priority, application Japan, Sep. 7, 1993, 5-221889

Int. Cl.[6] F16H *61/14*

U.S. Cl. 477—65 **4 Claims**

1. A hydraulic control circuit for an automatic transmission having gearing, a plurality of hydraulic frictional engagement elements for establishing plural gear stages, and a hydraulic power transmission device with a lockup clutch for transmitting power from an engine to the gearing, the lockup clutch having an application side oil chamber and a release side oil chamber, said hydraulic control circuit comprising:

a lockup relay valve for switching an oil pressure between the application side oil chamber and the release side oil chamber of the lockup clutch to apply and release the lockup clutch;



lockup switching means for switching said lockup relay valve;

a lockup control valve for increasing the pressure difference between the pressure in the application side oil chamber and the pressure in the release side oil chamber at the time of application of the lockup clutch, in accordance with rise of a signal pressure;

a transient pressure control valve for controlling transient pressure to the hydraulic frictional engagement elements in accordance with the signal pressure;

a single pressure regulator valve for regulating the signal pressure fed to said lockup control valve and said transient pressure control valve;

a signal pressure relay valve having:

a first input port for receiving the signal pressure;

a second input port for receiving a substitution pressure, in place of said signal pressure, for output to said lockup control valve to apply the lockup clutch;

a first output port connected to said lockup control valve;

a second output port connected to said transient pressure control valve;

a valve member movable between a first position, in which it provides communication between said first input port and said second output port and communication between said second input port and first output port, and a second position in which it provides communication between said first input port and said first output port; and

signal pressure switching means for moving the valve member of said signal pressure relay valve selectively to either said first position or said second position.

5,486,147

FAILURE DETECTING SYSTEM AND METHOD FOR AUTOMATIC TRANSMISSION

Ryuzo Sakakiyama, Tokyo; Kiminaga Shirakawa, Kitatsuru, and Kazunari Tezuka, Niiza, all of, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1994, Ser. No. 282,310

Claims priority, application Japan, Jul. 29, 1993, 5-188196; Jul. 29, 1993, 5-188197; Aug. 30, 1993, 5-214284; Dec. 27, 1993, 5-332180

Int. Cl.[6] F16H *61/12;59/42*

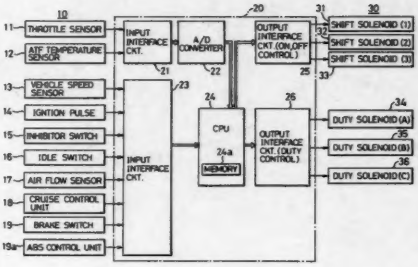
U.S. Cl. 477—125 **8 Claims**

1. A failure detecting system for an automatic transmission of a vehicle employing an engine rotational speed as one of control signals to control said automatic transmission, the system comprising:

engine speed detecting means for detecting said engine rotational speed;

air amount detecting means for detecting an amount of induction air; and

transmission control prohibiting means for prohibiting a transmission control based on said engine rotational speed, when said amount of induction air detected by said air amount detecting means is larger than a predetermined value, and when said engine rotational speed detected by said engine speed detecting means continues to be smaller than a predetermined value for more than a predetermined time.



5,486,148

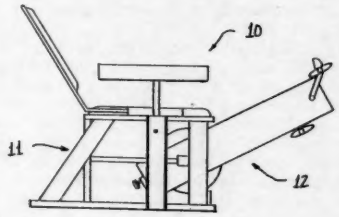
FLEXIBLE CYCLING APPARATUS

Gary L. Johnston, P.O. Box 183, Cowarts, Ala. 36321

Continuation-in-part of Ser. No. 131,396, Oct. 5, 1993, Pat. No. 5,342,261. This application Apr. 6, 1994, Ser. No. 223,714 The portion of the term of this patent subsequent to Aug. 30, 2011, has been disclaimed.

Int. Cl.[6] A63B *22/06*

U.S. Cl. 482—57 **9 Claims**



9. A flexible cycling apparatus which comprises:

a structural frame unit comprising a rigid frame, a seat mounted on said rigid frame and having a back support means moveable along said rigid frame in a substantially horizontal direction, and an assembly support;

a pedal mechanism assembly unit having a pedal assembly and attachment means, wherein said assembly unit is coupled to said assembly support of said structural frame unit to be pivoted in either the upward or downward direction, the point of pivot being moveable along said assembly support in a substantially horizontal direction;

wherein said apparatus is collapseable into a more compact configuration by positioning said pedal mechanism assembly unit such that at least a majority of said assembly unit is within said structural frame unit.

5,486,149

FRICTION RESISTANCE EXERCISE DEVICE

Fred T. Smith, and Fred P. Smith, both of Alpine, Utah, assignors to F. S. New Products, Inc., Alpine, Utah

Continuation of Ser. No. 21,186, Feb. 22, 1993, abandoned. This application May 19, 1994, Ser. No. 246,310

Int. Cl.[6] A63B *21/018*

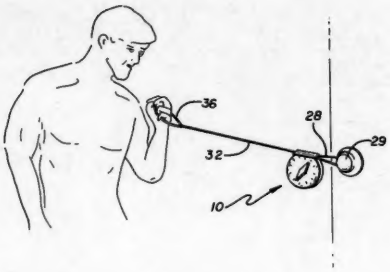
U.S. Cl. 482—120 **49 Claims**

1. In combination for use in exercise apparatus attachable to restraining means,

a rotatable disc having a first surface,

at least one brake liner having first and second surfaces and having its first surface disposed in frictional relationship to the first surface of the disc,

a rotatable sleeve having an annular configuration,



a constrainable spring operatively coupled to the sleeve for imposition of a constraint on the spring, and a release of the constraint on the spring, in accordance with the rotation of the sleeve,

a first cable movable in first and second opposite directions and operatively coupled to the sleeve for constraining the spring upon a movement of the cable in the first direction,

first means operatively coupled to the sleeve and the disc during the movement of the cable in the first direction for moving the disc in accordance with the movement of the sleeve, and

second means for providing a release of the constraint on the spring, without moving the disc, upon the release of the first cable,

a casing enveloping the rotatable disc, the brake liner, the constrainable spring, the first means and the second means,

a second cable attached at one end to the casing for the imposition of a constraining force in a first direction substantially tangential to the annular periphery of a sleeve and constructed at the second end for coupling to the restraining means, and

the first cable extending through the casing for operative coupling to the sleeve and for the imposition of a force on the sleeve in a second direction tangential to the annular periphery of the sleeve but opposite to the first tangential direction.

5,486,150

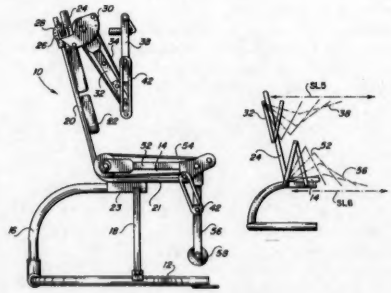
EXERCISE SYSTEM, APPARATUS AND METHOD

Lucian Randolph, 11456 Peachstone La., Orlando, Fla. 32821-7971

Filed Apr. 30, 1993, Ser. No. 56,845

Int. Cl.[6] A63B *21/02;23/035*

U.S. Cl. 482—133 **37 Claims**



33. A multiple purpose system for exercising different muscles and for limiting a single exercise to a single straight line for a selected muscle, the system comprising:

an exercise frame including an upstanding back rest and a seat extending generally lateral from the back rest;

a pair of exercise arm assemblies, each arm assembly supported along one side of the back rest and having a proximal end adjacent the back rest and a distal end;

a pair of exercise leg assemblies, each leg assembly supported along one side of the seat and having a proximal end adjacent the seat-back rest intersection, each leg assembly also including a distal end;

means for limiting movement of the distal end of each exercise assembly along a straight line which passes through the corresponding proximal and distal ends; and

means for applying an exercise resistance to movement of the exercise arm assembly along the corresponding straight line.

5,486,151

MACHINING CENTER FOR MACHINING A WORKPIECE BY MEANS OF AT LEAST TWO INTERCHANGEABLE TOOLS

Klaus Bergmann, Melinde; Jacques Schwab, and Martin Frauenfelder, both of Breganzona, all of, Switzerland, assignors to Mikron S. A. Agno, Switzerland

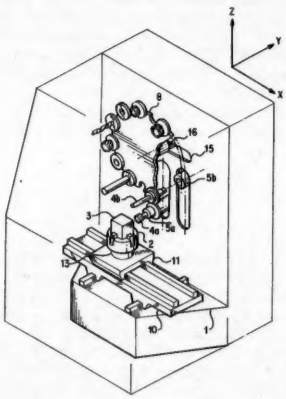
PCT No. PCT/EP92/02125, § 371 Date Sep. 10, 1993, § 102(e) Date Sep. 10, 1993, PCT Pub. No. WO93/05926, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 16, 1992, Ser. No. 64,026

Claims priority, application Switzerland, Sep. 19, 1991, 2780/91; Feb. 27, 1992, 603/92

Int. Cl.[6] B73Q *3/157*

U.S. Cl. 483—1 **3 Claims**



1. A method for machining a workpiece on a table, comprising the steps of interchangeably inserting one of at least two tools into respective individually driven work spindles, and operating with at least one automatic tool changer with magazine such that simultaneous numerically controlled movements allows tool changing in one spindle while another spindle is operating on the workpiece such that the spindles can sequentially perform cutting with linear movements other than movements being required for tool change essentially determining the chip-to-chip time being performed parallel in time independent of total changing time, whereby said tool magazine and said spindles are mounted to be movable for selective juxtaposition of said magazine with each of said spindles, with the table having at least two linear and orthogonal axes of movement and each of the spindles being movable along at least one axis orthogonal to the at least two linear table axes.

5,486,152

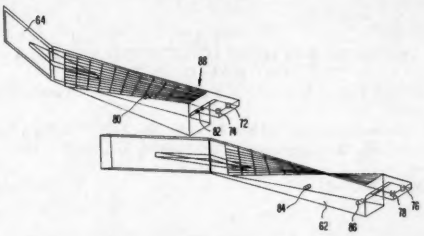
CARTON CLOSING PLOUGH AND PROCESS

Daniel J. Heinz, Joppa; Gregory A. Lathrop, Manchester, both of Md.; Lawrence W. Caldwell, Hanover, Pa., and Pasquale Buzzeo, Westminster, Md., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 17,065, Feb. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 15,951, Feb. 10, 1993, abandoned. This application Oct. 6, 1994, Ser. No. 319,356

Int. Cl.[6] B65H *45/22*

U.S. Cl. 493—468 **7 Claims**



1. A plough having a contour with a surface having the curvature necessary for closing a flap of a carton at or within 90% of constant angular velocity when the carton is conveyed at constant velocity.

5,486,153

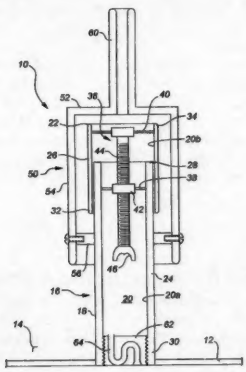
EXTERNALLY ADJUSTABLE LIQUID INTERFACE FOR A CENTRIFUGAL SEPARATOR

Earl Gingras, Eckville, Canada, assignor to Gingras Separators Inc., Edmonton, Canada

Filed May 19, 1995, Ser. No. 444,742

Int. Cl.[6] B04B *11/00*

U.S. Cl. 494—57 **4 Claims**



1. An externally adjustable liquid interface for a centrifugal separator having a rotatably mounted drum with a circumferential sidewall, characterized by:

a. a tubular liquid outlet extending into the drum, the outlet having an exterior surface, an interior bore, and a top lip which represents an interface for liquids of differing densities, the tubular liquid outlet comprising:

i. a first tubular member having a first end, a second end and an interior bore, the first end extending into the drum and the second end affixed to the sidewall of the drum;

ii. a second tubular member having a first end, a second end and an interior bore, the first end of the second tubular member telescopically mating with the first end of the first tubular member, such that the interior bore of the second tubular member is co-axial with the interior bore of the first tubular member, the second end of the second tubular member serving as the top lip of the tubular liquid outlet;

iii. a threaded coupling between the first tubular member and the second tubular member, such that upon rotation of the second tubular member the relative telescopic position of the second tubular member and the first tubular member is altered; and

iv. a fitting disposed in the interior bore of the tubular liquid outlet and non-rotatably coupled with the second tubular member and adapted to receive a working end of a tool, such that a tool extended from exterior of the drum through the interior bore of the tubular liquid outlet can be used to rotate the second tubular member thereby altering the relative telescopic position of the first tubular member and the second tubular member to raise and lower the position of the top lip of the tubular liquid outlet which serves as the liquid interface; and

b. a cap covering the top lip of the tubular liquid outlet, the cap having a top and an annular sidewall, a plurality of flow passages extending between the annular sidewall of the cap and the tubular liquid outlet whereby liquid communicates with the top lip, the top of the cap having a vent.

5,486,154

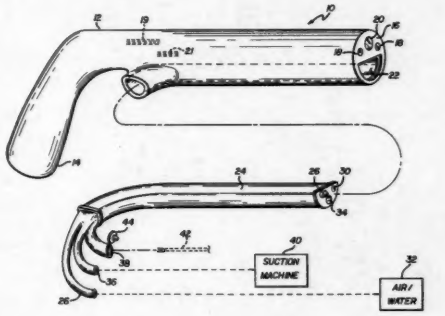
ENDOSCOPE

Brian S. Kelleher, 733 Genter St., La Jolla, Calif. 92037

Filed Jun. 8, 1993, Ser. No. 72,935

Int. Cl.[6] A61B *1/00*

U.S. Cl. 600—104 **41 Claims**



1. An endoscope for inspecting or applying therapy to an inner body cavity of a patient, including,

a shell,

illuminating means fixedly positioned in the shell,

imaging means fixedly positioned in the shell,

there being a lumen within the shell, and

a core removably disposed within the lumen in the shell in sealing relationship with the shell with the illuminating means and the imaging means exterior in the shell to the core,

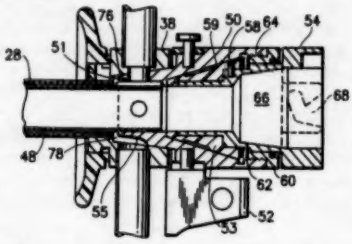
the core including a first passageway disposed within the core for providing for a removal of materials from the inner body cavity of the patient.

5,486,155

ROTATABLE ENDOSCOPE SHEATH

Richard P. Muller, Bronx, N.Y., and Richard J. O'Hare, Wilton, Conn., assignors to Circon Corporation, Santa Barbara, Calif.

Filed Jul. 15, 1994, Ser. No. 275,845
Int. Cl.[6] A61B *1/012;1/307*
U.S. Cl. 600—137 **16 Claims**



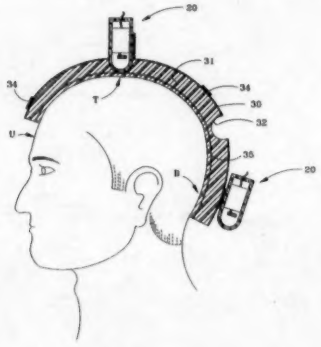
1. An endoscope comprising:
a working element; and
a first sheath covering a portion of the working element, the first sheath having a first section and a second section, the first section having a tube and means for connecting a second sheath over a portion of the tube, the second section being rotatably attached directly to the first section and being directly stationarily connected to the working element, wherein the working element is rotatable relative to the tube.

5,486,156

HEAD VIBRATOR

Stephen J. Takach, 3 Durban Ave., Hopatcong, N.J. 07843

Filed Feb. 7, 1994, Ser. No. 192,621
Int. Cl.[6] A61H *1/00*
U.S. Cl. 601—70 **9 Claims**



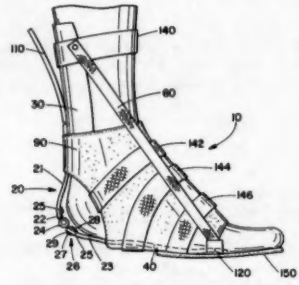
1. A vibrating body massage unit comprising;
a unitary pad means for snugly fitting about an area of a user's body, said pad means having a smooth unbroken surface facing the user and comprising a pliable material firmly fitting around a body portion of the user wherein said smooth unbroken surface is a coated rubber-like foam material;
multiple vibration generation means with each generation means including control means; and
attachment means on both said pad means and said vibration generation means for detachably connecting each of said vibration means to said pad means;
said attachment means including means for selectively attaching each of the vibration generation means at a plurality of different locations on the outside of said pliable material
said means for selectively attaching comprising depressions in an outer surface of said pliable material and protrusions on said vibration generation means for detachably interconnecting with said depressions; whereby
said control means on each of said vibration generation means enables a user to predetermine the frequency and the amplitude of each said vibration generation means such that a beat is generated within the user's body corresponding to the differences between the various predetermined frequencies produced by said multiple vibration generation means.

5,486,157

DYNAMIC MULTI-ANGULAR ANKLE AND FOOT ORTHOSIS DEVICE

Anthony DiBenedetto, 7306 Yellow Creek Dr., Poland, Ohio 44514

Continuation-in-part of Ser. No. 190,985, Feb. 3, 1994, abandoned. This application Dec. 9, 1994, Ser. No. 353,089
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—27 **14 Claims**



1. An ankle and foot orthosis device adaptable for use in a human ankle and foot complex to allow movement of a foot having a posterior heel and a toe, the device comprising:
a calf plate;
a foot plate; and,
an upright supporting the calf plate and the foot plate, the upright having a contour portion adapted to conform to the posterior heel of the foot, the contour portion having a hinge for facilitating dorsiflexion and plantar flexion and a pivot point located on the contour portion spaced from the hinge for facilitating inversion, eversion, pronation and supination of the foot.

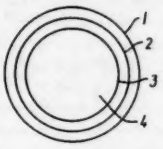
5,486,158

GROOVED HYDROCOLLOIDAL DRESSING

Peter B. Samuelsen, Rungsted Kyst, Denmark, assignor to Coloplast A/S, Denmark

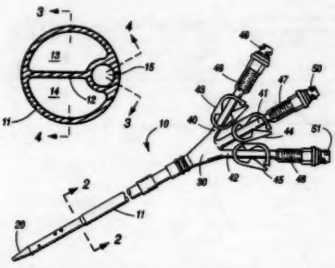
PCT No. PCT/DK92/00197, § 371 Date Jan. 10, 1994, § 102(e) Date Jan. 10, 1994, PCT Pub. No. WO93/00056, PCT Pub. Date Jan. 7, 1993
PCT Filed Jun. 23, 1992, Ser. No. 167,983
Claims priority, application Denmark, Jun. 24, 1991, 1227/91
Int. Cl.[6] A61F *13/00*
U.S. Cl. 602—46 **14 Claims**

1. A dressing having a skin-friendly moisture absorbing sheet adhering to skin and mucous membranes, the dressing comprising:
a layer of a water swellable colloid which is dispersed in or mixed with a water insoluble viscous elastomer binder, the layer having a central part, a distal, having a contour formed therein that at least partially surrounds the central part of the layer, and an opposing proximal surface;
a non-adhesive cover layer disposed on the distal surface and following the contour of the at least one groove, the cover layer being water impervious; and



a removable protecting sheet, disposed on the proximal surface.

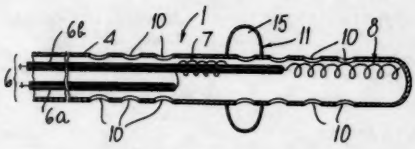
5,486,159
MULTIPLE-LUMEN CATHETER
Sakharam D. Mahurkar, 6171 N. Sheridan Rd., Ste. 1112, Chicago, Ill. 60660
Filed Oct. 1, 1993, Ser. No. 130,279
Int. Cl.[6] A61M *37/00*
U.S. Cl. 604—4 **43 Claims**



1. A blood purification system comprising:
a dialysis system for purifying a patient's blood; and
a multiple-lumen catheter coupled to said dialysis system comprising an elongated cylindrical tube having an internal diametral septurn extending along the length thereof, said septum and the walls of said tube forming at least three longitudinal lumens, first and second of said lumens having substantially semi-circular transverse cross-sections occupying the major portion of the transverse cross section of the interior of said tube, and a third lumen having a small transverse cross-section and located at the intersection of one diametral end of said septum with said tube, between a pair of adjacent comers of said first and second lumens.

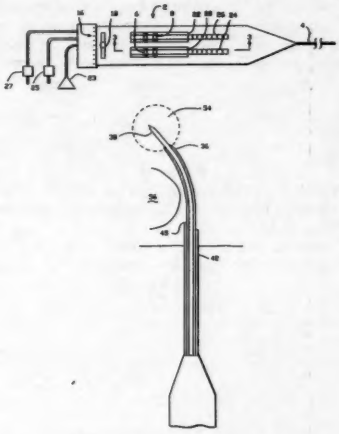
5,486,160
DEVICE AND METHOD FOR THE COMBINED ELECTROPHARMACOLOGICAL TREATMENT OF THE BLADDER AND THE PROSTATIC URETHRA
Cino Rossi, Rome; Silvio Eruzzi, Mantova, both of, Italy; Robert L. Stephen, Salt Lake City, Utah, and Franco Lugnani, Trieste, Italy, assignors to Physion S.r.l., Italy
Filed May 4, 1994, Ser. No. 237,672
Int. Cl.[6] A61N *1/05*
U.S. Cl. 604—21 **16 Claims**

1. Device for the combined electropharmacological treatment of the bladder, urethra and prostate comprising a bougie that comprises a flexible tubular body having a distal tip which is provided, at a proximal end, with a connector having at least one inlet, said body having, at a distal end, openings for connection to an outside,



an opening in its tip and elastic sealing means for obstructing a prostatic urethra arranged perimetrically around it, said bougie being internally provided with an electrode that comprises at least two independent conductors that slide axially, each conductor having an insulated portion and conducting portions that are mutually spaced.

5,486,161
MEDICAL PROBE DEVICE AND METHOD
Ronald G. Lax, Grass Valley; Stuart D. Edwards, Los Altos, and Hugh R. Sharkey, Redwood Shores, all of Calif., assignors to ZoMed International, Menlo Park, Calif.
Continuation-in-part of Ser. No. 929,638, Aug. 12, 1993, abandoned, and a continuation-in-part of Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675, and a continuation-in-part of Ser. No. 62,364, May 13, 1993, Pat. No. 5,435,805, and a continuation-in-part of Ser. No. 61,647, May 13, 1993, Pat. No. 5,421,819, and a continuation-in-part of Ser. No. 61,072, May 14, 1993, Pat. No. 5,385,544. This application Nov. 8, 1993, Ser. No. 148,441
Int. Cl.[6] A61B *17/39*
U.S. Cl. 604—22 **3 Claims**



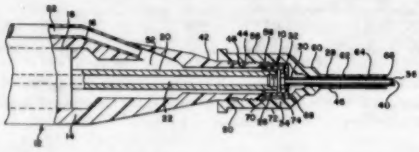
1. An Rf ablation device for inserting an Rf ablation electrode through tissue to a tissue site to be ablated, the Rf ablation device comprising:
a rigid hollow needle having a needle lumen and an open, sharpened distal end adapted to penetrate tissue:
a hollow Rf electrode positioned within the needle lumen and extendable beyond the distal end of the needle lumen, the Rf electrode having an electrode lumen and an open, distal end, the electrode lumen serving as a fluid conduit for delivering fluid through the open, distal end of the electrode;
a fiber optic positioned within the electrode lumen for providing visualization during ablation, the fiber optic having a distal end proximally distanced from the electrode distal end; and
a fluid delivery source for delivering fluid through the electrode lumen to simultaneously cleanse the fiber optic and irrigate the tissue ablation site.

5,486,162

BUBBLE CONTROL DEVICE FOR AN ULTRASONIC SURGICAL PROBE

Joseph F. Brumbach, Niles, Ill., assignor to FibraSonics, Inc., Chicago, Ill.

Filed Jan. 11, 1995, Ser. No. 371,145
Int. Cl.[6] A61B *17/00*
U.S. Cl. 604—22 **18 Claims**



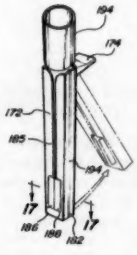
1. A bubble control device for an ultrasonic surgical probe having a needle and a sleeve spaced from the needle for at least a portion of the length of the needle and between which is an annular passage to which fluid is supplied, said device comprising a cylindrical hollow body having a bore defined therein and adapted to be positioned in the annular passage between the needle and the sleeve with the needle being received in said bore, said bore defined by said body having a first portion of greater diameter at one end and extending axially for more than half the length of the body and forming a cavity about the needle which is adapted to receive fluid supplied to the passage, said bore defined by said body tapering to a second portion of lesser diameter, which lesser diameter is greater than the outside diameter of the needle, said second portion extending to the opposite end of the body, and said body having at least one groove formed on the peripheral surface thereof extending from one end of the body to the other, whereby fluid supplied to the annular passage between the needle and the sleeve is restricted in its passage by being forced through said at least one groove formed on the peripheral surface of the body and through the space between said second portion of the body and the needle, thereby reducing the passage of bubbles formed in the fluid.

5,486,163

PROTECTIVE SHIELD FOR HYPODERMIC SYRINGE

Don A. Haynes, Okemos, Mich., assignor to Haynes-Miller, Inc., Okemos, Mich.

Continuation-in-part of Ser. No. 65,807, May 21, 1993, Pat. No. 5,312,368. This application May 16, 1994, Ser. No. 243,562
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—192 **52 Claims**



1. A shield for protecting the needle of a syringe, said syringe having a body portion and a needle, said shield comprising:

a connector for connecting the shield to the syringe;

at least one protective arm hinged to said connector;

biasing means normally biasing said arm to a closed position wherein said arm conceals said needle, said protective arm being manually displacable with respect to said syringe to an open position to expose said needle; said protective arm automatically traveling from the open position to the closed position and being unhindered throughout its travel from the open position to the closed position;

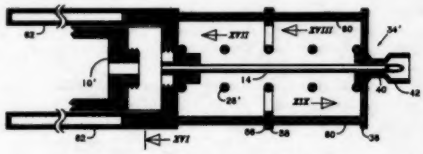
said protective arm and said connector being integrally formed as a one piece unit, with said biasing means being defined by a living hinge formed between said protective arm and said connector.

5,486,164

PASSIVE PROTECTOR FOR HYPODERMIC NEEDLES

Donald A. Streck, Kailua, Hi., assignor to Showa Hatsumei Kaisha, Ltd., Kailua, Hi.

Filed May 6, 1993, Ser. No. 57,514
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—198 **8 Claims**



1. Apparatus for providing passive protection against accidental needle-stick for a hypodermic needle extending from a hub comprising:

a) a tip protector comprising a cross-piece disposed transverse to the needle having an elongated first bore therethrough through which the needle passes and having a bell-shaped tip-guard extending from the cross-piece concentrically about said first bore and covering a tip portion of the needle with said tip protector in an extended position, said tip protector being slidably moveable along the needle supported by said elongated first bore between said extended position and a retracted position with said tip portion exposed for use, said first bore being close adjacent and behind said tip portion when in said extended position and behind and removed from said tip portion when in said retracted position;

b) guide means for guiding said tip protector between said extended position and said retracted position, said guide means comprising,

b1) a pair of guide tubes extending from the hub away from said tip protector and parallel to the needle, and

b2) a pair of support rails integrally formed as part of and extending from said cross-piece towards said pair of guide tubes and parallel to the needle, said pair of support rails being slidably disposed within respective ones of said pair of guide tubes;

c) a helical spring concentrically disposed about the needle between the hub and said cross piece biasing said tip protector to said extended position; and,

d) releasable locking means for automatically releasably locking said tip protector in said extended position when said tip protector moves to said extended position from a position retracted therefrom.

5,486,165

METHOD AND APPLIANCE FOR MAINTAINING THE NATURAL INTRAOCULAR PRESSURE

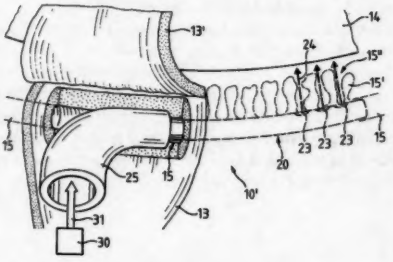
Robert Stegmann, 88, Copselaine, Lynnwood Glen, Pretoria, 0181, South Africa

Filed Jan. 13, 1994, Ser. No. 181,174

Claims priority, application Switzerland, Jan. 10, 1992, 062/92

Int. Cl.[6] A61M *5/00*

U.S. Cl. 609—294 **13 Claims**



1. An apparatus for injecting a highly viscous medium into Schlemm's canal for maintaining a constant pressure of the aqueous humor circulating from the posterior chamber to the anterior chamber of the eye of an organism, said apparatus comprising an injection unit and a tube which has a closed end and is made of biocompatible material, said tube being connected to the injection unit and designed in the form of an arc of a circle defined by a single curvature with a radius in the range of about 12 mm to 14 mm to generally conform to the curvature of the Schlemm's canal, said tube having one end provided on the inside of the arc facing the tubular tissue with at least one orifice and another end provided with a coupling for connection of the tube to the injection unit for introduction of viscous medium into the Schlemm's canal to thereby hydraulically expand the Schlemm's canal and burst it at one or more points for creating a corresponding number of openings to form a connection between the Schlemm's canal and the trabecular tissue for drainage of aqueous humor.

5,486,166

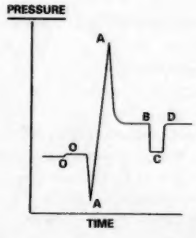
FIBROUS NONWOVEN WEB SURGE LAYER FOR PERSONAL CARE ABSORBENT ARTICLES AND THE LIKE

David F. Bishop, Dunwoody, and Clifford J. Ellis, Woodstock, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 206,986, Mar. 4, 1994, abandoned. This application Feb. 9, 1995, Ser. No. 386,244

Int. Cl.[6] A61F *13/15;13/20*

U.S. Cl. 604—366 **16 Claims**



1. A fibrous nonwoven web comprising:

a plurality of thermoplastic fibers heat bonded to one another to form a lofty nonwoven web having a basis weight of at least 20 grams per square meter, a void volume of between about 80 and about 117 cubic centimeters per gram of web at 689 dynes per square centimeter pressure, a permeability of about 8,000 to about 15,000 darcy, a porosity of about 98.6% to about 99.4% and a surface area per void volume of about 10 to about 25 square centimeters per cubic centimeter.

5,486,167

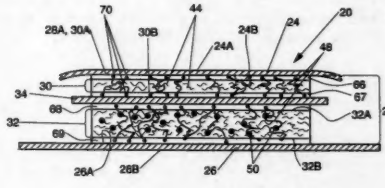
ABSORBENT ARTICLE HAVING BLENDED MULTI-LAYER ABSORBENT STRUCTURE WITH IMPROVED INTEGRITY

Jerry L. Dragoo, Fairfield; Michael S. Bogdanski, Cincinnati; Nicholas A. Ahr, Cincinnati, and John R. Noel, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 153,739, Nov. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 911, Jan. 6, 1993, Pat. No. 5,300,054, Ser. No. 637,571, Jan. 3, 1991, abandoned, Ser. No. 810,774, Dec. 17, 1991, abandoned, Ser. No. 874,871, Apr. 28, 1992, abandoned, Ser. No. 874,872, Apr. 28, 1992, abandoned, Ser. No. 882,738, May 14, 1992, abandoned, Ser. No. 915,133, Jul. 23, 1992, Ser. No. 915,134, Jul. 23, 1992, abandoned, Ser. No. 915,201, Jul. 23, 1992, abandoned, Ser. No. 915,202, Jul. 23, 1992, abandoned, Ser. No. 915,284, Jul. 23, 1992, abandoned, Ser. No. 915,285, Jul. 23, 1992, abandoned, Ser. No. 944,764, Sep. 14, 1992, Ser. No. 957,575, Oct. 7, 1992, Ser. No. 966,240, Oct. 26, 1992, abandoned, Ser. No. 108,861, Aug. 18, 1993, Pat. No. 5,439,458, and Ser. No. 931,122, Aug. 17, 1992, Pat. No. 5,304,161, which is a continuation of Ser. No. 637,090, Jan. 3, 1991, abandoned. This application Apr. 12, 1995, Ser. No. 427,181

Int. Cl.[6] A61F *13/15;13/20*

U.S. Cl. 604—384 **24 Claims**



1. An absorbent article comprising:

a liquid pervious topsheet;

a liquid impervious backsheet joined to said topsheet;

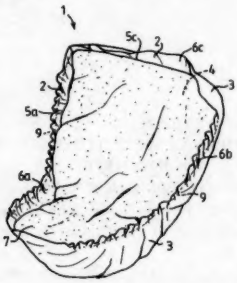
an absorbent core positioned between said topsheet and said backsheet, said absorbent core comprising a mixture of absorbent gelling material and fibers, said fibers comprising a blend of cellulose fibers and liquid insensitive crimped synthetic fibers comprising about 5% to about 90% by weight of the fibers in said absorbent core, said crimped synthetic fibers having a length of between about 0.6 cm and about 5 cm, a denier of between about 1 ½ and about 40 denier per fiber, and a crimp angle of between about 70° and about 91° as measured between the adjacent portions of a fiber that have a crimp formed therebetween; and an acquisition layer positioned between said topsheet and said absorbent core.

5,486,168

INCONTINENCE GUARD FOR MEN

Bo Runeman, Partille, and Peter Rönnberg, Mölndal, both of, Sweden, assignors to Molnlycke AB, Gothenburg, Sweden

Continuation of Ser. No. 855,042, Jun. 1, 1992, abandoned. This application Dec. 13, 1994, Ser. No. 354,805
Claims priority, application Sweden, Nov. 17, 1989, 8903868
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—385.1 **23 Claims**



1. A male incontinence guard, comprising:
an inner, liquid permeable casing layer;
an outer, liquid impermeable casing layer;
an absorbent pad having a first end, said casing layers enclose said pad so as to include a first casing end and a second casing end opposite to said first casing end, a first side edge along one side of said pad and a second side edge along an opposite side of said pad;
said absorbent pad narrows at the first end;
a first elastic device attached in a prestretched state to the inner casing layer and extending from the first casing end along at least a part of said first side edge; and,
a second elastic device attached in a prestretched state to the inner casing layer and extending from the first casing end along at least a part of said second side edge;
said elastic devices arranged such that contraction of said elastic devices causes a curvature such that said inner casing layer at the first casing end of said pad takes a concave shape and said outer casing layer at said first casing end of said pad takes a convex shape, the curvature being more pronounced at the first casing end and decreasing away from the first casing end along the side edges because local resistance of the pad to bending increases toward the second casing end.

5,486,169

Patent Not Issued For This Number

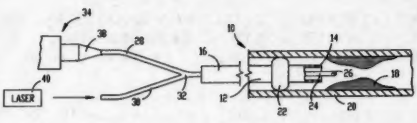
5,486,170

MEDICAL CATHETER USING OPTICAL FIBERS THAT TRANSMIT BOTH LASER ENERGY AND ULTRASONIC IMAGING SIGNALS

Thomas R. Winston, Leawood, and John M. Neet, Shawnee, both of Kans., assignors to Ultrasonic Sensing and Monitoring Systems, Leawood, Kans.

Division of Ser. No. 966,279, Oct. 26, 1992, Pat. No. 5,350,377. This application Sep. 22, 1994, Ser. No. 310,498
Int. Cl.[6] A61B *17/36*
U.S. Cl. 606—16 **7 Claims**

1. A catheter for insertion into the body to effect medical treatment, comprising:
an elongated catheter having opposite ends;
an optical fiber extending through said catheter and terminating in a tip adapted to be disposed in the body with the catheter, said optical fiber having an input end opposite said tip;



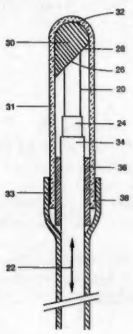
an ultrasonic transducer means for generating and receiving ultrasonic signals;
a means for generating laser energy; and
a directing means for directing both ultrasonic signals and laser energy to the optical fiber at the input end for transmission through the fiber to said tip and for directing reflected ultrasonic signals from said tip through said optical fiber to said ultrasonic transducer means, the reflected ultrasonic signals providing information regarding the treatment area adjacent the tip of the optical fiber, the laser energy being applied to effect treatment to the same area.

5,486,171

TRANSPARENT CAP FIBER OPTICA LASER BEAM ANGLE DELIVERY DEVICE

Marilyn M. Chou, Piedmont, Calif., assignor to Xintec Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 87,981, Jul. 7, 1993, Pat. No. 5,354,294, and a continuation-in-part of Ser. No. 67,566, May 26, 1993, and a continuation-in-part of Ser. No. 14,814, Feb. 8, 1993, Pat. No. 5,366,456. This application Oct. 7, 1994, Ser. No. 319,954
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—16 **42 Claims**



1. A transparent cap fiber optic laser beam angle delivery device, said device comprising:
an optical fiber, said fiber having:
a receiving end,
a central axis, and
a transmitting end, said transmitting end having a bias cut end surface, said bias cut end surface defining a predetermined operative angle with said central axis of said fiber;
a transparent cap, said transmitting end disposed within said transparent cap such that said transmitting end of said optical fiber is protected from exposure to operating debris and fluids; and
an attaching means, said attaching means securing said transparent cap to said fiber.

5,486,172

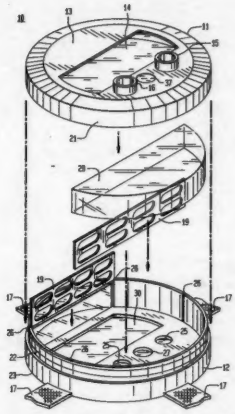
APPARATUS FOR TREATING CUTANEOUS VASCULAR LESIONS

Cyrus Chess, 49 Blue Spruce Cir., Weston, Conn. 06883

Continuation-in-part of Ser. No. 706,243, May 28, 1991, Pat. No. 5,282,797, which is a continuation of Ser. No. 358,890, May 30, 1989, Pat. No. 5,057,104. This application Jan. 31, 1994, Ser. No. 189,942

Int. Cl.[6] A61N *5/06*

U.S. Cl. 606—20 **21 Claims**



1. An apparatus adapted to be secured to a patient for treating cutaneous vascular lesions in a target area of the patient, said apparatus comprising:

a lower housing having a bottom with an opening therethrough,

an upper housing removably connected in liquid tight engagement to said lower housing, said upper housing having a top with an opening therethrough and substantially in alignment with the opening of said lower housing;

means for connecting said lower housing to said upper housing;

a pair of glass windows, one of said pair of glass windows removably secured in the opening of said lower housing, the other of said pair of glass windows being removably secured in the opening of said upper housing; and

at least one fenestrated wall removably positioned at an inner surface of said lower housing to form a first and a second chamber when said upper housing and said lower housing are connected together, said first chamber being adapted to receive a cooling medium, the second chamber for preventing the cooling medium from obstructing a passage of a laser beam between said pair of glass windows,

wherein the at least one fenestrated wall permits any portion of the cooling medium that is in liquid form to pass through the apparatus.

5,486,173

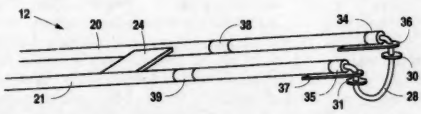
SELF-GUIDING ELECTRODE AND CUTTING TIP FOR TISSUE RESECTION

Thierry G. Vancaillie, 133 Pin Oak Forest, San Antonio, Tex. 78232

Filed Dec. 8, 1993, Ser. No. 164,107

Int. Cl.[6] A61B *17/39*

U.S. Cl. 606—45 **6 Claims**



1. An electrode, comprising

first and second electrical conductors, each said conductor having a lateral compliance, a proximal end and a distal end, said conductors being spaced apart and oriented proximal end to proximal end and distal end to distal end;

at least one spring centered joint having a predetermined lateral compliance in series with each said first and second electrical conductor;

a tissue cutting loop having first and second ends;

coupling means for coupling said cutting loop first end to said first conductor distal end and said cutting loop second end to said second conductor distal end; and

at least one tissue skid coupled to each said first and second electrical conductor proximate each said distal end.

5,486,174

FASTENER FOR THE OSTEOSYNTHESIS OF THE SPINAL COLUMN

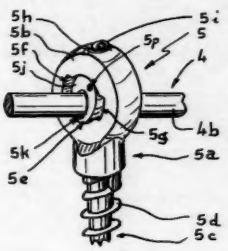
Jacques Fournet-Fayard, Valence; Olivier Galland, Meylan; Christophe Garin, Lyons, and Alain Lucet, Dijon, all of, France, assignors to Soprane S.A., Lyons, France

Filed Feb. 23, 1994, Ser. No. 200,409

Claims priority, application France, Feb. 24, 1993, 93 02357; Feb. 9, 1994, 94 01661

Int. Cl.[6] A61B *17/70;17/86*

U.S. Cl. 606—61 **15 Claims**



1. A fastener for implanting to spaced vertebrate for relieving stress on a vertebral disc of a vertebral stage of patient's spinal column which is adjacent at least two vertebral stages which are mechanically united to one another and wherein each of the vertebral stages includes a vertebra having pedicles, the fastener comprising, a fastener rod having first and second portions, said second portion having a diameter which is less than the diameter of said first portion, at least two pedicle screw means, each pedicle screw means having a portion which is adapted to be anchorable into adjacent pedicles of the vertebrae of the at least two vertebral stages, each of said pedicle screw means including tightening means for securing said first portion of said rod to said at least two pedicle screw means so as to be in fixed relationship to the at least two vertebral stages when said fastener is in use, a guidance means having a screw portion which is adapted to be anchored into a pedicle of the vertebra of the next adjacent vertebral stage and a head portion, said head portion having an open passageway, said second portion of said fastener rod being continuously slidably engaged within said open passageway when said fastener is implanted in the vertebrae and said first portion of said rod is secured to said at least two pedicle screw means which are fixed to the at least two vertebral stages and said guidance means is secured to the next adjacent vertebral stage, whereby said fastener relieves stress on the disc adjacent the at least two vertebral stages when in use.

5,486,175

Patent Not Issued For This Number

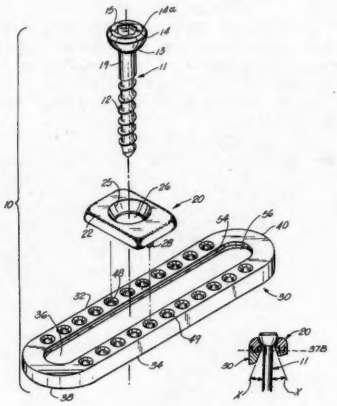
5,486,176
ANGLED BONE FIXATION APPARATUS

Bryan D. Hildebrand, Cleveland Heights, Ohio; Laura C. Small, Memphis, Tenn.; Hansen A. Yuan, Fayetteville, N.Y.; B. Thomas Barker; Matthew M. Morrison, both of Memphis, Tenn.; Abraham Salehi, Bartlett, Tenn., and Forrest C. Smith, Collierville, Tenn., assignors to Smith & Nephew Richards, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 856,707, Mar. 24, 1992, abandoned, and Ser. No. 62,825, May 14, 1993, abandoned, each , May 14, 0which is a continuation-in-part of Ser. No. 675,740, Mar. 27, 1991, Pat. No. 5,129,899. This application Feb. 23, 1994, Ser. No. 200,700

Int. Cl.[6] A61B *17/80;17/70*

U.S. Cl. 606—71 **21 Claims**



1. An angled bone fixation apparatus, comprising:

a) a plurality of bone screws having a first end portion and a second end portion, said first end portion configured to be surgically implantable into a patient's vertebral bone mass and at first and second spaced apart positions on the bone mass, said second end portion having a head portion with a load transfer surface thereon and a top portion;

b) an elongated plate member having upper and lower surfaces angled with respect to each other and an elongated plate slot having a longitudinally extending axis, a transverse cross section and a vertical centerline, said slot being surrounded by a peripheral portion having outer opposed edges;

c) said slot defining an opening for receiving the bone screws, the plate member having a first and second angled sidewall at the slot, said sidewalls each forming an acute angle relative to the vertical centerline of the plate member whereby the slot is wider at the lower surface than at the upper surface.

d) a washer interfacing with the plate member and each bone screw, for distributing load from each bone screw to the plate member, said washer including a central opening having a vertical centerline and upper and lower surfaces, said lower surface having a pair of laterally spaced apart projections extending therefrom;

e) said plate member having a plurality of adjustment openings in the upper surface, and each of the washer projections sized and shaped to fit in selected pairs of adjustment openings;

f) said angled plate sidewalls being angled to constrict bone screw angulation in a medial/lateral transverse plane when each bone screw interfaces with the washer and the washer interfaces with the plate member.

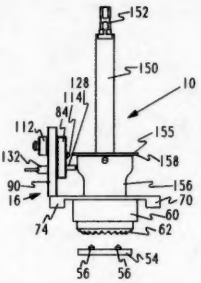
5,486,177
PATELLA PLANER WITH ADJUSTABLE STOP

Charles W. Mumme, and Philip Gold, both of Austin, Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.

Filed Dec. 20, 1994, Ser. No. 359,873

Int. Cl.[6] A61B *17/17*

U.S. Cl. 606—79 **14 Claims**



1. A surgical apparatus for preparing a surface on a patella of a patient to receive a prosthetic implant, said apparatus comprising:

a circularly driven surface planer,

a base plate for supporting said patella,

guide means connected to said base plate for guiding said surface planer against said patella to cut away a portion of said patella, and

stop means connected to said guide means for limiting said portion of said patella to be cut away by said surface planer, said stop means having

means for selecting a depth of cut into said patella, and

an adjustable pointer for setting said means for selecting a depth of cut to an initial zero condition dependant on the thickness of said patella.

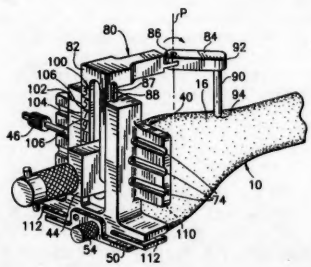
5,486,178
FEMORAL PREPARATION INSTRUMENTATION SYSTEM AND METHOD

W. Andrew Hodge, 120 Clarke Ave., Palm Beach, Fla. 33480

Filed Feb. 16, 1994, Ser. No. 197,387

Int. Cl.[6] A61B *17/56*

U.S. Cl. 606—82 **17 Claims**



1. An improvement in a femoral preparation instrumentation system for preparing a femur, at the distal femur thereof, for the implant of a femoral knee prosthesis, the femoral preparation instrumentation system including an intramedullary alignment rod and a femoral sizing guide for placement on the intramedullary alignment rod which is to be seated generally axially within the femur and which includes a rod portion for projecting from the distal femur in a longitudinal direction when the intramedullary alignment rod is seated within the femur, the improvement comprising:

a sizing guide block;

axially projecting foot means on the sizing guide block for engaging the posterior distal femur;

block mounting means for mounting the sizing guide block upon the rod portion of the intramedullary alignment rod for selective movement in altitudinal directions relative to the longitudinally directed rod portion, the block mounting means including engaging means for precluding rotation of the sizing guide block relative to the rod portion about the longitudinal direction when the sizing guide block is mounted upon the rod portion;

selective locking means for selectively locking the sizing guide block against altitudinal movement relative to the rod portion when the sizing block is in a sizing position wherein the foot means of the sizing guide block is located against the posterior distal femur, such that the sizing guide block is selectively locked in place upon the seated intramedullary alignment rod in the sizing position;

a stylus for engaging the anterior cortex;

stylus mounting means for mounting the stylus upon the sizing guide block for unrestricted movement in altitudinal directions relative to the sizing guide block to enable location of the stylus against the anterior cortex with the stylus mounted upon the sizing guide block;

size indicator means for providing an indication, when the sizing guide block is in the sizing position and the stylus is located against the anterior cortex, of the size of the femoral knee prosthesis to be implanted; and

a posterior femoral cutting guide on the sizing guide block for guiding a cutting instrument to establish a preliminary posterior femoral cut when the sizing guide block is in the sizing position.

5,486,179

Patent Not Issued For This Number

5,486,180

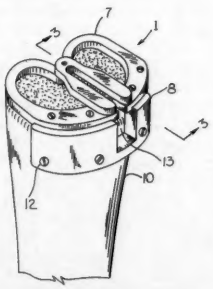
APPARATUS FOR MILLING BONE

Terry L. Dietz, Columbia City, and Richard D. Vanlaningham, Milford, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Continuation-in-part of Ser. No. 832,098, Feb. 6, 1992, Pat. No. 5,344,423. This application Jun. 10, 1994, Ser. No. 258,114

Int. Cl.[6] A61F *5/04*

U.S. Cl. 606—87 **7 Claims**



1. An apparatus for producing a planar surface on a portion of a bone, the apparatus comprising a milling device, a guide, and means for attaching the guide to the bone, the guide having a reference surface and a non-linear track, the reference surface being adapted to engage the milling device to constrain the milling device to motion in a plane, the non-linear track having a width approximately equal to the width of a portion of the milling device, said portion engageable within the track, the close fit of said portion within the track forcing the milling device to move in a non-linear motion along the non-linear track such that when the milling device is guided along the track, the milling device will form the planar surface on the bone parallel to the reference surface.

5,486,181

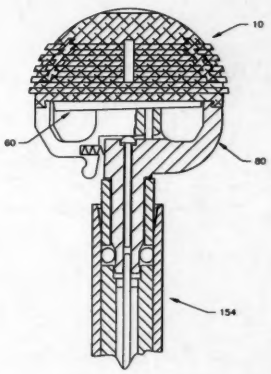
ACETABULAR CUP, METHOD AND TOOL AND INSTALLING THE SAME

Robert C. Cohen, Rockaway Township, and Rafial Zubok, Midland Park, both of N.J., assignors to Implex Corporation, Allendale, N.J.

Filed Aug. 4, 1994, Ser. No. 286,003

Int. Cl.[6] A61F *2/46;* **A61B** *17/88*

U.S. Cl. 606—91 **5 Claims**



1. A tool for installing an acetabular cup having an outer shell of a hard material with a cavity circumscribed by a peripheral surface, and a bearing insert of a material which is softer than said material of said outer shell disposed within said cavity of said shell, said tool comprising:

handle means for aligning and driving the acetabular cup into said acetabulum;

adaptor means for coupling said handle means to said acetabular cup, said adaptor means having leg means for engaging corresponding leg receiving means positioned on the peripheral surface of the outer shell when said leg means are brought into contact with the peripheral surface of the outer shell and said adaptor means is rotated relative to said acetabular cup, said leg means including a pair of substantially parallel oriented leg members unitarily formed with said adaptor means,

and locking means for preventing relative rotation between said adaptor means and the acetabular cup when said leg means of said adaptor means are engaged with the leg receiving means of the outer shell, said locking means being slidably oriented between said pair of leg members.

5,486,182

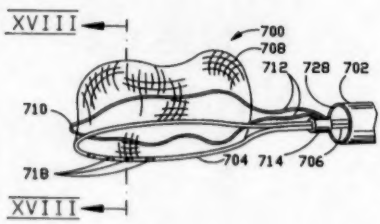
POLYP RETRIEVAL ASSEMBLY WITH SEPARABLE WEB MEMBER

Naomi L. Nakao, and Peter J. Wilk, both of New York, N.Y., assignors to Wilk & Nakao Medical Technology Inc., New York, N.Y.

Continuation-in-part of Ser. No. 12,657, Feb. 1, 1993, Pat. No. 5,336,227, which is a continuation-in-part of Ser. No. 788,035, Nov. 5, 1991, Pat. No. 5,201,740, and Ser. No. 892,214, Jun. 2, 1992, Pat. No. 5,190,542. This application Mar. 14, 1994, Ser. No. 213,196

Int. Cl.[6] A61B *17/22;17/36*

U.S. Cl. 606—114 **15 Claims**



1. An endoscopic surgical instrument for use in snare cauterization operations, comprising:

a tubular sheath member;

loop means made at least in part of an electrically conductive material for forming an alternately expandable and contractible cauterization loop;

an electrically conductive wire operatively connected to said loop means and extending longitudinally through said sheath member, said wire being slidable longitudinally through said sheath;

electrical connector means at a proximal end of said wire for coupling said wire to a source of electrical energy;

a flexible web member connected to said loop means essentially around a circumference thereof to form a capture pocket, said loop means defining a mouth opening of said pocket, said web member being attached to said loop means in a manner so as to expose said loop means to enable effective cauterization of organic tissues by said loop means, said web member being removably attached to said loop means along a major portion thereof; and

means on said sheath member at a distal end thereof for at least substantially separating said web member from said loop means upon a proximally directed stroke of said wire at the termination of a cauterization operation.

5,486,183

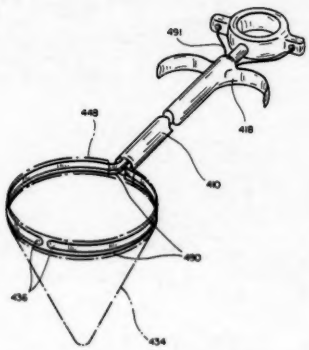
DEVICE OR APPARATUS FOR MANIPULATING MATTER

Lee M. Middleman, Portola Valley; Walter R. Pyka, Redwood City; Michael Buhler, Los Gatos; Philippe Poncet; Karl Van Dyk, both of Fremont, and James E. Jervis, Atherton, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 594,768, Oct. 9, 1990, abandoned, Ser. No. 608,117, Nov. 1, 1990, abandoned, Ser. No. 594,769, Oct. 9, 1990, abandoned, Ser. No. 608,121, Nov. 1, 1990, abandoned, Ser. No. 594,871, Oct. 9, 1990, abandoned, Ser. No. 594,896, Oct. 9, 1990, abandoned, Ser. No. 594,874, Oct. 9, 1990, abandoned, Ser. No. 594,873, Oct. 9, 1990, abandoned, and Ser. No. 656,651, Feb. 15, 1991, abandoned. This application Oct. 9, 1991, Ser. No. 774,016

Int. Cl.[6] A61B *17/22*

U.S. Cl. 606—127 **21 Claims**



1. A surgical apparatus for manipulating matter at an intended manipulation temperature in a confined or inaccessible space, comprising:

(i) manipulator means at least partly constructed of an elongate shape memory alloy member said shape memory alloy member having a distal end said shape memory alloy member having two arms at said distal end thereof, said two arms having tips that approach but are not fixed to one another, said shape memory alloy member having pseudoelasticity at the intended manipulation temperature, and

(ii) a barrier member spanning said two arms;

(iii) a hollow cannula initially holding the shape memory alloy member in a relatively straightened state, and

(iv) actuating means for extending the shape memory alloy member with said barrier member from the housing to manipulate matter within said space and for withdrawing the shape memory alloy member into the housing, the arrangement being such that the shape memory alloy member bends or twists pseudoelastically in a lateral or helical sense to manipulate the matter on extending from the housing at said manipulation temperature, and the shape memory alloy member becomes relatively straightened on withdrawal into the housing at said temperature.

5,486,184

Patent Not Issued For This Number

5,486,185

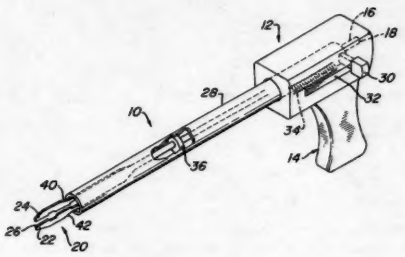
SURGICAL APPARATUS

Michael W. Freitas, Irving, and Wayne D. Miller, Bedford, both of Tex., assignors to Dexide, Inc., Fort Worth, Tex.

Continuation of Ser. No. 629,993, Dec. 19, 1990, abandoned, which is a continuation of Ser. No. 303,850, Jan. 30, 1989, abandoned. This application Jun. 28, 1991, Ser. No. 723,190

Int. Cl.[6] A61B *17/12;17/28;17/32*

U.S. Cl. 606—142 **8 Claims**



1. A surgical instrument for use in applying clips to tissue, the instrument adapted for passage through a surgical sleeve or cannula and into a bodily cavity, the instrument comprising:

a handle for gripping by a user's hand;

an elongate probe extending from the handle and adapted for passage through the surgical sleeve, the probe including:

a generally tubular probe sleeve extending from the handle; and

a probe member extending from the handle, generally concentrically through the probe sleeve, and terminating in an end;

a pair of jaws rotatably coupled to the end of the probe member, the jaws for selectively compressing the surgical clip about a portion of tissue in the bodily cavity, the jaws including a pair of camming surfaces and extending a fixed axial distance from the handle, at least the jaws being freely rotatable relative to the handle to permit the handle to be rotated with the jaws in a selected position in the bodily cavity;

seal means disposed in the probe to prevent escape of fluid from the bodily cavity through the surgical instrument; and

actuator means coupled to the probe to selectively actuate the jaws by longitudinal movement of the probe sleeve over the camming surfaces of the jaws, wherein the jaws remain at the fixed longitudinal distance from the handle.

5,486,186

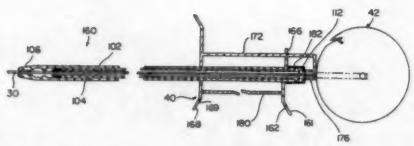
LIGATING INSTRUMENT AND METHODS OF LIGATING TISSUE IN ENDOSCOPIC OPERATIVE PROCEDURES

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Division of Ser. No. 930,320, Aug. 17, 1992, Pat. No. 5,334,199. This application Feb. 14, 1994, Ser. No. 195,491

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—148 **35 Claims**



1. A ligating instrument for ligating anatomical tissue comprising

a tubular member having a distal end, a proximal end and a lumen;

a length of ligature material extending through said lumen and having a proximal end and a distal end forming a loop disposed externally of said tubular member distal end for being positioned around anatomical tissue to be ligated;

a handle mounting said tubular member proximal end for being grasped by a hand of a surgeon;

an operating member coupled with said ligature material for moving said ligature material in a proximal direction within said tubular member to tighten said loop around the anatomical tissue to form a ligature in response to manual movement of said operating member by the hand grasping said handle; and

a cutter mounted by said tubular member for cutting said ligature material away from the thusly formed ligature.

5,486,187

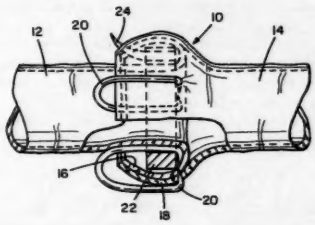
ANASTOMOSIS DEVICE AND METHOD

Robert R. Schenck, 1100 N. Lake Shore Dr., Chicago, Ill. 60611

Filed Jan. 4, 1994, Ser. No. 177,260

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—153 **6 Claims**



1. An apparatus for anastomosing a prepared first living vessel end to a prepared second living vessel end comprising:

an encircling member having an interior surface and an exterior surface and through which the first vessel end of the first living vessel extends to pass the interior surface to evert over the exterior surface and the second end of the second living vessel extends over the encircling member to engage the everted first vessel end of the first living vessel to interconnect the living vessels in apposition at the encircling ring; and

at least one needle-like projection extending from the encircling member back toward the first living vessel as the vessel extends through the encircling member for holding the first and second vessel ends in a sealed apposition at the encircling member;

the encircling member further comprising a plurality of fasteners having each an elongated wire-like body with a substantially enclosing configuration, a pair of opposing ends for impaling the vessels and flexibility to change from a first position in which the ends are spaced for enabling the fastener to be moveable by the surgeon to substantially encompass the encircling member and the vessel ends and a second position in which the ends impale the vessels adjacent the vessel ends while the fastener secures the vessel ends against the encircling member for securing the vessels in a sealed apposition at the encircling member.

5,486,188

KERATOSCOPIC SURGICAL INSTRUMENT FOR MAKING RADIAL AND ARCUATE CORNEAL INCISIONS

Alan D. Smith, 1406 French Ave., Odessa, Tex. 79761

Filed Nov. 15, 1993, Ser. No. 151,996

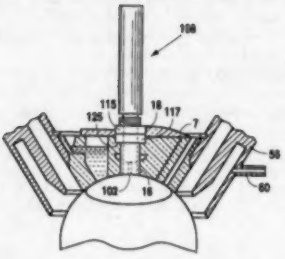
Int. Cl.[6] A61B *17/32*

U.S. Cl. 606—166 **39 Claims**

1. An ophthalmic surgical instrument comprising:

a) a lens support means:

b) a light-transmissive guide lens having a central axis mounted on said lens support means and including:



1) a conclave lower surface shaped to matingly receive the cornea of an eye. and

2) a linear slot extending through said guide lens, adapted for receiving and guiding a narrow surgical incision-forming means extending through said guide lens and into the cornea of the eye for movement along a desired radial incision path in the cornea; and

c) visual confirmation permitting means comprising mirror surface means for permitting the user to view the incision in a radial direction through the cornea to provide visual confirmation of the penetration depth of a corneal surgical incision made by said incision forming means concurrently with the making of the incision.

5,486,189

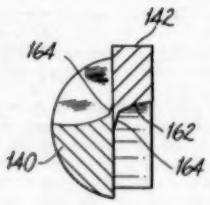
ENDOSCOPIC SURGICAL INSTRUMENT

Matthew Mudry, Fairfield; Ernie Aranyi, Easton, and David A. Nicholas, Trumbull, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 781,064, Oct. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 593,670, Oct. 5, 1990, abandoned. This application Oct. 22, 1993, Ser. No. 141,417

Int. Cl.[6] A61B *17/32*

U.S. Cl. 606—171 **21 Claims**



1. An endoscopic surgical instrument including a handle assembly, a body assembly extending from said handle assembly, said body assembly including an narrow tube member and a rod member, said rod member moveable in response to movement of said handle assembly and having a bearing post at a distal end portion thereof, said endoscopic surgical instrument comprising:

a tool mechanism including a pair of reciprocating members pivotally secured at a pivot pin to a distal end portion of said body assembly and movable toward and away from each other in face-to-face planar engagement in response to movement of said handle assembly, one of said reciprocating members being provided with a pair of camming members extending proximally thereof and defining an elongated slot receiving said bearing post and defining a camming surface for slidable engagement with said bearing post; and

collar means coupled to a distal end portion of said body assembly and disposed about said pivot pin for urging said reciprocating members towards each other to restrict lateral separation at said pivot point.

5,486,190

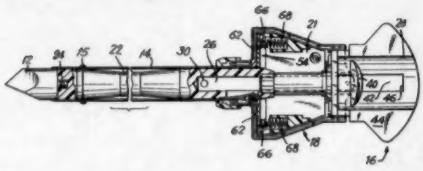
SAFETY TROCAR

David T. Green, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 176,001, Dec. 30, 1993, abandoned, which is a continuation of Ser. No. 693,582, Apr. 30, 1991, Pat. No. 5,295,993. This application Dec. 7, 1994, Ser. No. 352,274

Int. Cl.[6] A61B *17/32*

U.S. Cl. 606—184 **7 Claims**



1. A trocar comprising:

(a) a trocar assembly which includes a piercing tip mounted to an obturator shaft and a trocar housing, the obturator shaft being movably mounted with respect to the trocar housing;

(b) an actuating member which includes delatching structure and which defines a passage into which the piercing tip and at least a portion of the obturator shaft are adapted to pass to define an assembled condition, the actuating member and the piercing tip being slidably mounted with respect to each other when in the assembled condition such that the piercing tip is movable between an extended position and a retracted position relative to the actuating member;

(c) a first spring which abuts the obturator shaft and which biases the piercing tip and the obturator shaft proximally toward the trocar housing;

(d) a second spring which abuts the actuating member and which biases the actuating member distally; and

(e) a latching member extending from the obturator shaft which releasably maintains the piercing tip in the extended position against the bias of the first spring;

wherein the delatching structure of the actuating member releases the latching member as the actuating member slides relative to the piercing tip, thereby allowing the piercing tip to move proximally from the extended position to the retracted position under the bias of the first spring.

5,486,191

WINGED BILIARY STENT

Pankaj J. Pasricha, and Anthony N. Kalloo, both of Columbia, Md., assignors to John Hopkins University, Baltimore, Md.

Filed Feb. 2, 1994, Ser. No. 190,465

Int. Cl.[6] A61M *5/00;27/00*

U.S. Cl. 606—191 **20 Claims**

1. A stent comprising:

an elongated main body member having first and second longitudinal ends and a longitudinal axis extending therebetween;

a plurality of wing elements extending outwardly from said main body member, said wing elements being substantially uniformly distributed about an outer circumference of said main body member, each said wing element having a length at least about as great as a length of said main body member and a width substantially greater than a cross-sectional dimension of said main body member, wherein each said wing element has a plurality of longitudinally extending grooves defined on each Side face thereof.

5,486,192

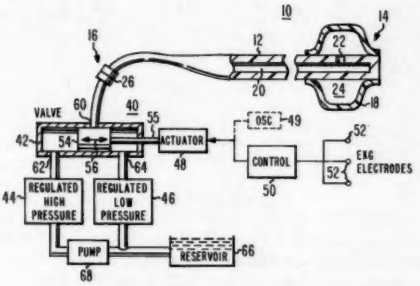
CYCLIC CORONARY ANGIOPLASTY SYSTEM

Paul Walinsky, 8910 Carlisle Rd., Wyndmoor, Pa. 19118, and William H. Meise, P.O. Box 344, Penns Park, Pa. 18943

Filed Jun. 3, 1994, Ser. No. 253,720

Int. Cl.[6] A61M *29/00*

U.S. Cl. 606—194 **3 Claims**



1. A method for performing balloon angioplasty on a patient,

inserting into a coronary artery of said patient a balloon catheter including a balloon inflation orifice at a proximal end thereof; and

generating and coupling to said balloon catheter balloon inflation and deflation pressures, which cycle in an automatic manner between said inflation and deflation pressures in such a manner as to inflate said balloon during systole, and deflate said balloon during diastole.

5,486,193

SYSTEM FOR THE PERCUTANEOUS TRANSLUMINAL FRONT-END LOADING DELIVERY OF A PROSTHETIC OCCLUDER

George Bourne, Libertyville, Ill.; Randall W. Davis, Chelmsford, Mass.; George Duval, New Ipswich, N.H.; Dennis Goodine, Dracut, Mass.; James E. Lock, Newton, Mass.; Gerry Ouellette, Framingham, Mass.; Stanton B. Perry, Marblehead, Mass.; Maria Wagner, Groton, Mass., and Gregory R. Whittaker, Burlington, Mo., assignors to C. R. Bard, Inc., Murray Hill, N.J.

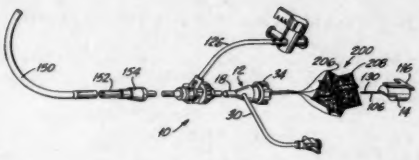
Continuation of Ser. No. 49,162, Apr. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 824,019, Jan. 22, 1992, abandoned. This application May 1, 1995, Ser. No. 432,971

Int. Cl.[6] A61M *29/00*

U.S. Cl. 606—194 **59 Claims**

1. A front-end loading delivery device for transluminal delivery of a collapsible prosthetic occluder, comprising:

a front-end loading portion comprising a main body having a distal end, a proximal end and a lumen extending therethrough, a portion of said lumen being tapered inwardly toward a smaller diameter distal portion;



an infusion port extending through said main body and in direct communication with said distal portion of said lumen;

a valve for sealing said lumen proximally of said small diameter distal portion; and

a control assembly comprising:

an elongated shaft having a proximal end, a flexible distal end and a lumen extending therethrough;

a locking wire extending through said lumen of said elongated shaft having a proximal end and a locking member at a distal end which is extendable beyond said flexible distal end of said elongated shaft;

a portion of said flexible distal end of said elongated shaft being adapted to lockingly hold said locking member and a locking member of a collapsible prosthetic occluder.

5,486,194

COMPRESSIVE HEMOSTATIC BELT

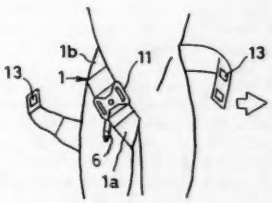
Atsuko Kawasaki, Akashi; Takefumi Nakashita, Kobe; Yoshiharu Inui, Takarazuka, and Toshimichi Shirouzu, Akashi, all of, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Dec. 2, 1993, Ser. No. 160,214

Claims priority, application Japan, Dec. 4, 1992, 4-325049; Aug. 4, 1993, 5-193233; Aug. 4, 1993, 5-193234; Aug. 4, 1993, 5-193235; Aug. 17, 1993, 5-202450; Jan. 4, 1993, 5-247647

Int. Cl.[6] A61B *17/12*

U.S. Cl. 606—203 **11 Claims**



1. A compressive hemostatic belt comprising

a single band of non-stretchable or low-stretchable fiber, non-woven fabric or film;

a rigid case attached to a predetermined position on one side of said band;

a balloon received in said rigid case adapted to be inflated by being filled with a fluid;

a buckle attaching plate having engaging means on the opposite sides thereof, said buckle attaching plate being rotatably attached to said rigid case on an opposite side of said band; and

a pair of buckles attached to opposite ends of said band and engagable with said engaging means of said buckle attaching plate to form a crossed relationship of said band on said rigid case receiving said balloon;

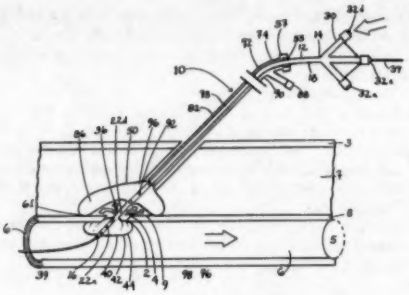
adjacent angles of said crossed relationship of said band being adjustable by rotation of said buckle attaching plate.

5,486,195

METHOD AND APPARATUS FOR ARTERIOTOMY CLOSURE

Gene Myers, 2727 S. Tamiami Trail, Suite 2A, Sarasota, Fla. 34239, and William S. Coury, 2830 Bay Shore Cir., Sarasota, Fla. 34234

Filed Jul. 26, 1993, Ser. No. 97,401
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—213 **20 Claims**



1. An apparatus for sealing an arteriotomy site in a patient comprising:

a. a first elongated flexible catheter having a proximal end, a distal end, an external surface, and a wall portion defining at least one lumen extending substantially the entire length of said first catheter, and at least one opening through the external surface of said first catheter located adjacent the distal end, whereby a proximal end of at least one lumen is in fluid communication with the external surface of said first catheter via said opening;

b. means located adjacent the distal end of said first catheter for temporarily occluding an intravascular opening of the arteriotomy site when said occluding means is positioned in an intravascular space of the patient's artery proximate to the arteriotomy site;

c. a second elongated flexible catheter having a front end, a rear end, an outer surface a body portion, and a central bore defined by the body portion extending through the length of said second catheter communicating the front end with the rear end;

d. means located on said second catheter for debriding subcutaneous tissue from an exterior surface of the anterior arterial wall proximate to the arteriotomy site; and

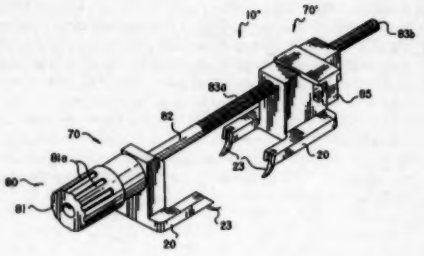
e. means located on a selected one of said catheters for delivering a material to the arteriotomy site that is capable of forming a substantially fluid tight seal of the arteriotomy site.

5,486,196

APPARATUS FOR THE CLOSURE OF WIDE SKIN DEFECTS BY STRETCHING OF SKIN

Bernard Hirshowitz; Amnon Levy; Alexander R. Gilat; Eitan Rogel, all of Haifa, Israel; Jeffrey Stein, Milford, Conn., and Julian Borgia, Belle Mead, N.J., assignors to Medchem Products, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 835,636, Feb. 13, 1992, Pat. No. 5,263,971, and a continuation-in-part of Ser. No. 3,751, Dec. 3, 1992. This application May 3, 1993, Ser. No. 55,413
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—218 **46 Claims**



5. A skin closing apparatus for closing skin defects comprising:

at least two retaining members, each of said retaining members exhibiting a coaxial bore and a plurality of skin insertion elements for insertion into the skin along margins of the skin defect;

a substantially rigid contracting mechanism extending through each said coaxial bore and connecting said retaining members; and

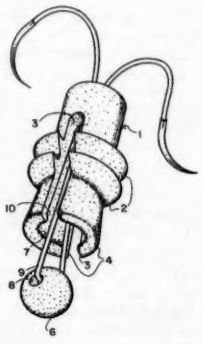
a clutch operatively engaging said contracting mechanism and configured so a force applied along the margins of the skin defect by said contracting mechanism is limited to a predetermined value.

5,486,197

TWO-PIECE SUTURE ANCHOR WITH BARBS

Thu A. Le, Matawan; Izi Bruker, Flemington; Brian H. Luscombe, Warren, and Dennis D. Jamiolkowski, Long Valley, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Mar. 24, 1994, Ser. No. 216,997
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—232 **15 Claims**



1. An apparatus for holding a suture comprising

a head;

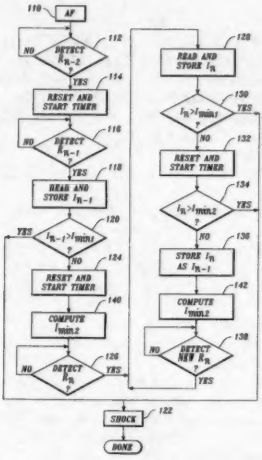
an expandable body extending distally from said head comprising at least two legs; and, wedging means for expanding said body by proximal relative movement of said wedging means within said expandable body comprising a substantially spherical object defining a hole therethrough for receipt of a suture and a suture received within said hole passing beyond said head to permit gripping of said suture for movement of said wedging means.

5,486,198

ATRIAL DEFIBRILLATOR AND METHOD FOR PROVIDING INTERVAL TIMING OF SUCCESSIVE INTERVALS PRIOR TO CARDIOVERSION

Gregory M. Ayers, 28308 NE. 146th St., Duvall, Wash. 98052; Clifton A. Alferness, 2202-236th Pl. NE., Redmond, Wash. 98053, and Harley G. White, 937-210th Ave. NE., Redmond, Wash. 98053

Filed Aug. 12, 1994, Ser. No. 289,701
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—5 **17 Claims**



1. An atrial defibrillator for providing cardioverting electrical energy to atria of a human heart, said atrial defibrillator comprising:

detecting means for detecting ventricular activations of the heart;

interval determining means for determining time intervals between immediately successive ventricular activations; and

cardioverting means for applying the cardioverting electrical energy to the atria of the heart when a second time interval between a third ventricular activation and a second ventricular activation immediately preceding the third ventricular activation satisfies a predetermined criteria with respect to a first time interval between the second ventricular activation and a first ventricular activation immediately preceding said second ventricular activation.

5,486,199

SYSTEM AND METHOD FOR REDUCING FALSE POSITIVES IN ATRIAL FIBRILLATION DETECTION

Jaeho Kim, 13323 NE. 69th Way, Redmond, Wash. 98052, and Harley G. White, 937-210th Ave. NE., Redmond, Wash. 98053

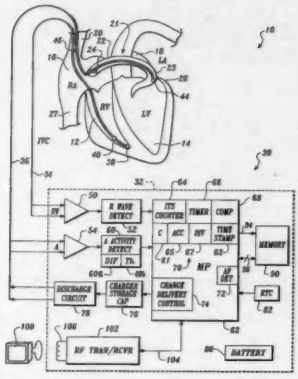
Filed Jul. 20, 1994, Ser. No. 278,055
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—5 **25 Claims**

1. A system for use in an implantable atrial defibrillator for reducing false positives in the detection of atrial fibrillation, said system comprising:

sensing means associated with the atria of the heart for sensing activity of the heart and generating a cardiac signal;

a first detector responsive to the cardiac signal for detecting cardiac events; and

a second detector responsive to the first detector and time spans between immediately successive detected cardiac events which are greater in duration than a preselected interval for detecting an absence of potential atrial fibrillation.

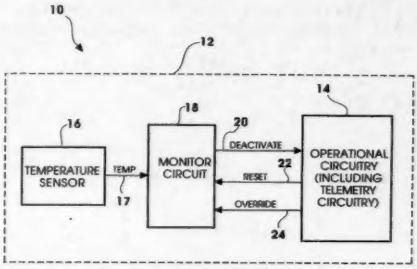


5,486,200

AUTOMATIC POSTMORTEM DEACTIVATION OF IMPLANTABLE DEVICE

Fredric W. Lindemans, Sittard, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 28, 1994, Ser. No. 233,905
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—5 **15 Claims**



1. A postmortem deactivation circuit for a body-implantable medical device which is automatically functional to deliver treatment, comprising:

an operational circuit to control the body-implantable medical device and direct delivery of treatment;

a sensor providing an output signal having a level which varies according to a physiological parameter known to change at time of death wherein said physiological parameter is body temperature;

a monitor circuit coupled to said operational circuit, said monitor circuit further coupled to said sensor to receive said output signal, said monitor circuit responsive to said output signal varying below a predetermined threshold to provide a deactivation signal to said operational circuit and suspend said delivery of treatment.

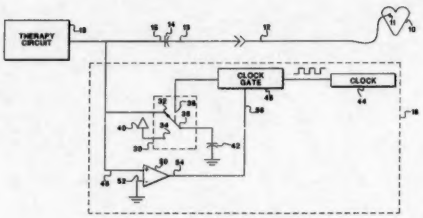
5,486,201

ACTIVE DISCHARGE OF A COUPLING CAPACITOR IN AN IMPLANTABLE MEDICAL DEVICE

Lyle D. Canfield, Lake Hughes, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Sep. 12, 1994, Ser. No. 303,800
Int. Cl.[6] A61N *1/37*
U.S. Cl. 607—13 **24 Claims**

23. An implantable medical device comprising:



a therapy circuit for providing therapeutic stimulation pulses to body tissue;

a coupling capacitor coupled between the therapy circuit and body tissue; and

a discharge circuit comprising:

a source of electrical charge;

a transfer capacitor; and

switching means for selectively electrically interconnecting the transfer capacitor between ground and one of said charge source and said coupling capacitor, whereby when connected to the charge source, the transfer capacitor is charged by the charge source and when connected to the coupling capacitor, the transfer capacitor causes charge to be transferred between the transfer capacitor and the coupling capacitor so as to discharge the coupling capacitor.

5,486,202

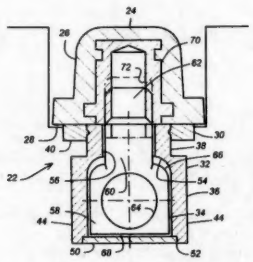
CARDIAC STIMULATOR LEAD CONNECTOR

James I. Bradshaw, Surfside, Tex., assignor to Intermedics, Inc., Angleton, Tex.

Filed Dec. 17, 1993, Ser. No. 169,673

Int. Cl.[6] A61N *1/372*

U.S. Cl. 607—37 **12 Claims**



1. In an implantable cardiac stimulator, a connector for receiving and retaining an electrical connector pin of an electrical lead adapted for conducting electrical signals between said cardiac stimulator and cardiac tissue, said connector comprising:

a first member having a first bore sized to receive said connector pin;

a second member having a second bore sized to receive said connector pin, said second member being movable relative to said first member between a first orientation in which said second bore is axially aligned with said first bore, and a second orientation in which said second bore is offset transversely relative to said second bore; and

manipulable means engaging said first and second members for causing said second member to move between said first and second orientations in response to manipulation of said manipulable means, such that a connector pin disposed within each of said first and second bores is urged transversely by said second bore against said first bore and thereby frictionally engaged by said first and second bores to retain said connector pin against axial withdrawal from said bores, said manipulable means comprising threaded means for engaging one of said first and second members in threaded relationship.

5,486,203

Patent Not Issued For This Number

5,486,204

METHOD OF TREATING A NON-PENETRATING HEAD WOUND WITH HYPOTHERMIA

Guy L. Clifton, Houston, Tex., assignor to University of Texas Health Science Center Houston, Houston, Tex.

Filed Sep. 20, 1994, Ser. No. 309,202

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—96 **6 Claims**

1. A method of treating brain injury in a human patient comprising the steps of

(1) beginning to cool the patient within 6 hours of the brain injury;

(2) beginning the introduction of a muscle relaxant and a sedative during the cooling step (1);

(3) continuing to cool the patient to 33° C. intravascular temperature;

(4) maintaining the patient at 32°–33° C. for 48 hours, continuing the introduction of muscle relaxant and sedative during the maintaining step (4);

(5) warming the patient at a rate of 1° C. per 4 hours;

(6) discontinuing the introduction of muscle relaxant and sedative when intravascular temperature reaches 35° C.; and

(7) discontinuing the warming step when the patient reaches normal body temperature.

5,486,205

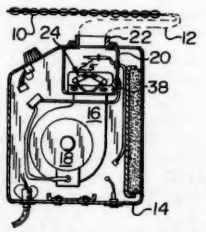
DIFFUSED AIR HEATING SYSTEM

Jeffrey L. Cornell, Coldwater, and Thomas H. Phlipot, Jackson, both of Mich., assignors to Progressive Dynamics, Inc., Marshall, Mich.

Filed Apr. 18, 1994, Ser. No. 229,382

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—104 **15 Claims**



1. An air diffuser system for a medical thermal blanket comprising, in combination, a plenum having an air inlet having an axis and an outlet, an elongated heat exchanger within said plenum in alignment with said inlet axis, an air diffuser located within said plenum in alignment with said inlet axis located intermediate said inlet and said heat exchanger receiving air discharged into said plenum from said inlet, said diffuser including an elongated opening having a length and a width, said opening length being substantially parallel to the length of said heat exchanger and of such configuration as to diffuse air received from said inlet substantially uniformly throughout the length of said heat exchanger.

5,486,206

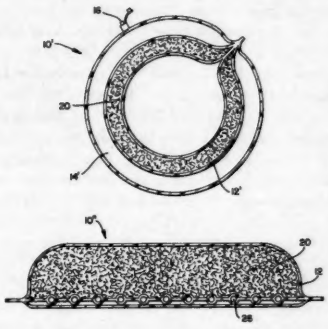
REUSABLE THERMAL PACK AND FLOW RETARDANT GEL FOR USE THEREIN

John R. Avery, Athens, Tenn., assignor to P.I., Inc., Athens, Tenn.

Continuation of Ser. No. 32,531, Mar. 15, 1993, abandoned, which is a continuation of Ser. No. 794,726, Nov. 15, 1991, abandoned. This application Jul. 12, 1994, Ser. No. 273,608

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—104 **9 Claims**



1. A thermal pack used for therapeutic hot and cold treatment, comprising:

a. a first flexible permanently sealed bag having at least one chamber;

b. a semi-rigid, non-flowing, viscous gel comprising a colloidal dispersion of a solid with a liquid and being sealed in said first bag, said gel being capable of retaining heat or cold, and said gel comprising a mixture of materials including clay, a liquid and a fibrous material, said clay being a clay substrate in an amount of from about 15% to 30% by weight, the liquid including glycol and water wherein the water is in an amount of from about 0% to 75% by weight, and said fibrous material being of sufficient concentration to impart a negligible flow rate in said gel and to provide uniform contact between the thermal pack with an affected area, wherein said sufficient concentration is about 1% to 10% by weight;

c. a second flexible sealed bag containing at least one open chamber which can be inflated, said second bag being disposed adjacent and coextensive with said first bag and being connected thereto; and

d. a means for inflating and sealing said second flexible sealed bag.

5,486,207

THERMAL PAD FOR PORTABLE BODY HEATING/COOLING SYSTEM AND METHOD OF USE

Imad Mahawili, 1603 Laraway Lake South East, Grand Rapids, Mich. 49546

Filed Sep. 20, 1994, Ser. No. 309,360

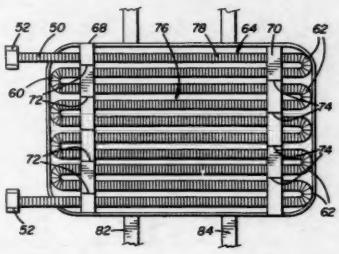
Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—104 **22 Claims**

1. A thermal pad for use with a portable body heating/cooling apparatus for thermal treatment of selected body portions including a reservoir, supply and return tubes for interconnection between the reservoir and pad and pump means for continually circulating fluid from the reservoir to the pad and back, the thermal pad comprising

a single corrugated tube including means for connection with the supply and return tubes, the single corrugated tube being folded on itself to form at least three parallel passes providing a treatment surface for the pad,

said at least three parallel passes having outermost tube passes, means securing adjacent end portions of the folded tubes, and



a cover extending transversely of the parallel passes opposite the treatment surface and operatively secured to the outermost tube passes whereby central parallel portions of the passes are movably restrained only by the cover in order to permit manipulation of the passes across the treatment surface.

5,486,208

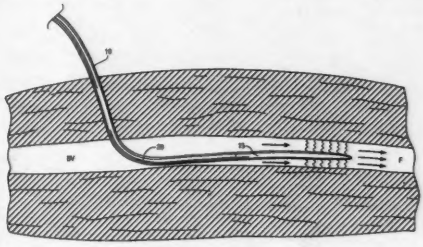
METHOD AND APPARATUS FOR CONTROLLING A PATIENT'S BODY TEMPERATURE BY IN SITU BLOOD TEMPERATURE MODIFICATION

Robert Ginsburg, 5100 S. Steele St., Greenwood Village, Colo. 80121

Continuation of Ser. No. 15,774, Feb. 10, 1993, abandoned. This application Oct. 18, 1994, Ser. No. 324,853

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—106 **7 Claims**



1. A method for increasing a patient's body temperature by warming blood within the patient, the method comprising the steps of:

inserting a catheter having a heating element into a blood vessel of the patient so that the heating element lies within the blood vessel;

providing heat transfer fins projecting radially outward from the catheter in the region of the heating element;

transferring heat to the blood through the heating element, wherein heat transfer is enhanced by the presence of the heat transfer fins.

5,486,209

FOOT PROSTHESIS HAVING AUXILIARY ANKLE CONSTRUCTION

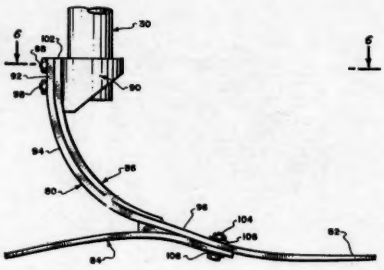
Van L. Phillips, 4702 San Jacinto Ter., Fallbrook, Calif. 92028

Continuation of Ser. No. 977,654, Nov. 17, 1992, abandoned, which is a continuation of Ser. No. 337,374, Apr. 13, 1989, Pat. No. 5,181,932. This application Jul. 1, 1994, Ser. No. 270,231

Int. Cl.[6] A61F *2/66*

U.S. Cl. 623—52 **18 Claims**

1. A lower limb prosthesis adaptable to a socket fitted to the stump of a lower-limb amputee for providing resilient kinematic



support to said amputee during normal walking, running and jumping activities, comprising:

a substantially rigid tubular pylon member providing substantially the sole support for said amputee and having a proximal end adapted to engage said socket and a distal end extending substantially vertically and terminating at about the location of said amputee's normal ankle joint, said distal end having front and rear sides; and

a detachable flexible foot prosthesis comprising a spring-like foot member adapted to be selectively attached to said distal end of said tubular pylon member according to a particular desired activity or a particular desired degree of kinematic resilience, said foot member further comprising:

an upper attachment section having a substantially vertical mounting surface adapted to closely receive a corresponding substantially vertical mounting surface disposed on said rear side of said distal end of said tubular pylon member;

an intermediate ankle section formed integrally with and curving substantially continuously downward and forward from said upper attachment section such that bending stress is distributed substantially evenly therethroughout;

a toe section having a proximal end and a distal end, said proximal end being formed integrally with said intermediate ankle section and said distal end extending forwardly to correspond to the toe of the user, said toe section curving substantially continuously forward from said proximal end to said distal end thereof such that bending stress is distributed substantially evenly therethroughout, said toe section meeting the ground at a point near said distal end of said toe section to define, together with said ankle section, a forward lever arm for said foot member for returning substantial energy to said user during toe off; and

a heel member extending substantially continuously rearward and downward from a point tangential to said intermediate ankle section such that bending stress is distributed substantially evenly throughout said heel member, said heel member providing a rearward lever arm for said foot member;

said heel member and said toe section providing substantially the sole support for loads incurred by said flexible foot prosthesis during heel strike and toe off, respectively;

whereby said foot member can be readily detached from said tubular pylon member and is interchangeable with like feet members having different resiliency characteristics without having to change or adjust said socket or the length of said tubular pylon member, such that a wide range of varying activity levels may be sustained in a single prosthetic device.

5,486,210

AIR BAG FABRIC CONTAINING GRAFT POLYMER THEREON

Richard C. Kerr, Rutherfordton, N.C.; John R. Damewood; Jill Menzel, both of Spartanburg, S.C.; Paul Thottathil, New Hyde Park, and Mohan L. Sanduja, Flushing, both of N.Y., assignors to Reeves Brothers, Inc., Spartanburg, S.C.

Filed Jan. 30, 1992, Ser. No. 828,073

The portion of the term of this patent subsequent to Apr. 18, 2012, has been disclaimed.

Int. Cl.[6] B60R *21/16;* D06M *13/00;14/00*

U.S. Cl. 8—115.66 55 Claims

1. A method for making an air bag which comprises:

forming a fabric structure of filaments or yarns in a predetermined configuration representative of an air bag; and

grafting a first component onto the filaments or yarns to provide increased resistance to fraying, and filament or yarn pull-out or distortion, during manufacture or use of the air bag compared to non-grafted filaments or yarns,

wherein either the grafting or the forming step is performed first.

5,486,211

WOOL PURIFICATION

John L. Glidden, Sr., 6 Mill St., Ashland, N.H. 03217

Filed Sep. 26, 1994, Ser. No. 312,135

Int. Cl.[6] D06L *1/02;1/08*

U.S. Cl. 8—142 9 Claims

9. A process of producing purified wool fabric substantially free of polypropylene contamination comprising the steps of:

supplying a wool fabric containing polypropylene contamination;

treating said fabric with a chlorinated hydrocarbon solvent to solubilize the polyolefin characterized in that said treatment is conducted at a temperature and pressure that does not cause degradation to the fabric, and

removing the solvent containing polyolefin contamination and recovering the purified fabric.

5,486,212

CLEANING THROUGH PERHYDROLYSIS CONDUCTED IN DENSE FLUID MEDIUM

James D. Mitchell, Alamo; Vincent E. Alvarez, Livermore; Daniel T. Carty, Danville, and James R. Latham, Livermore, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Division of Ser. No. 754,809, Sep. 4, 1991, Pat. No. 5,431,843. This application Mar. 15, 1995, Ser. No. 404,656

Int. Cl.[6] D06L *1/18*

U.S. Cl. 8—142 21 Claims

1. A method for the removal of stains from a substrate comprising:

contacting said stains with a cleaning composition comprising the combination of a cleaning-effective amount of a fluid medium which is either densified carbon dioxide or supercritical fluid; a source of hydrogen peroxide and an organic bleach activator therefor; and

removing said stains.

5,486,213

PROCESS FOR THE DYEING OF LEATHER WITH DYE MIXTURES

Peter Moser, Binningen, Switzerland; Campbell T. Page, Efringen-Kirchen, Germany, and Alois Püntener, Rheinfelden, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Jun. 22, 1993, Ser. No. 80,795

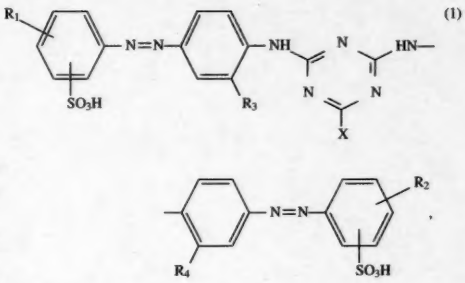
Claims priority, application Switzerland, Jun. 30, 1992, 2039/92

Int. Cl.[6] D06P *1/06*

U.S. Cl. 8—437 31 Claims

1. A process of dyeing leather with a dye mixture, which comprises applying a tinctorally effective amount of a dye mixture to the leather, which dye mixture comprises at least two metal-free dyes having a different color from each other, which color is selected from the group consisting of yellow, red and blue, which dyes are selected from the group consisting of

a) a yellow dye of the formula



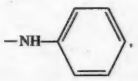
(1)

in which

R_1 and R_2, independently of one another, are each hydrogen, C_1–C_4alkyl or C_1–C_4alkoxy,

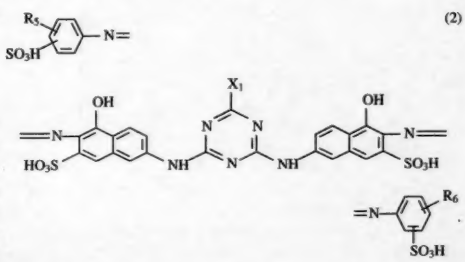
R_3 and R_4, independently of one another, are each C_1–C_4alkyl or C_1–C_4alkoxy and

X is halogen or



the phenyl radical being unsubstituted or substituted by C_1–C_4alkyl or C_1–C_4alkoxy,

b) a red dye of the formula

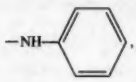


(2)

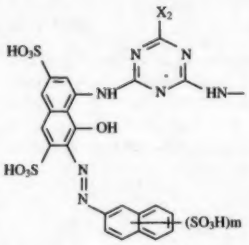
in which

R_5 and R_6, independently of one another, are each hydrogen, C_1–C_4alkyl or C_1–C_4alkoxy and

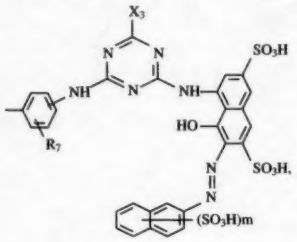
X_1 is halogen or



the phenyl radical being unsubstituted or substituted by C_1–C_4alkyl or C_1–C_4alkoxy, or of the formula

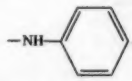


(2a)



in which

X_2 and X_3, independently of one another, are each halogen or

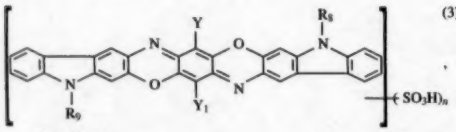


the phenyl radical being unsubstituted or substituted by C_1–C_4alkyl or C_1–C_4alkoxy,

R_7 is hydrogen, C_1–C_4alkyl or C_1–C_4alkoxy and

m is 1 or 2, and

c) a blue dye of the formula



(3)

in which

n is 3 or 4,

R_8 and R_9, independently of one another, are each hydrogen or C_1–C_4alkyl and

Y and Y_1, independently of one another, are each hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy, phenyl or phenoxy, it being possible for the phenyl radical in the last two groups to be substituted by C_1–C_4alkyl or C_1–C_4alkoxy.

5,486,214

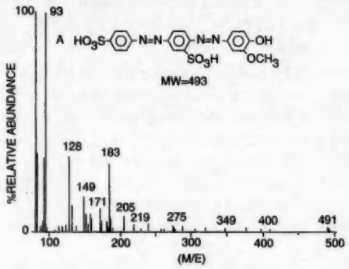
BIODEGRADABLE AZO DYES

Andrzej Paszczynski; Stefan Goszczynski; Ronald L. Crawford; Donald L. Crawford, and Maria B. Pasti, all of Moscow, Id., assignors to Idaho Research Foundation, Inc., Moscow, Id.

Continuation-in-part of Ser. No. 675,514, Mar. 27, 1991. This application Aug. 12, 1992, Ser. No. 930,162

Int. Cl.[6] C09B *67/02*

U.S. Cl. 8—524 **16 Claims**



1. A biodegradable composition comprising:

an azo dye having first and second nitrogen atoms linked to first and second aromatic rings, the first ring having a first substituent R_1 selected from the group consisting of hydroxy, alkoxy and amino, and a second constituent R_2 selected from the group consisting of hydrogen, lower alkoxy, lower alkyl and halogen;

an amount of lignin peroxidase effective to degrade said dye, wherein lignin peroxidase is converted to lignin peroxidase II as the dye is degraded; and

at least about 20 micromoles of veratryl alcohol, which amount is effective to recycle lignin peroxidase II to lignin peroxidase.

5,486,215

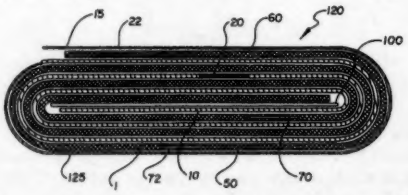
ELECTRODE ASSEMBLY AND METHOD

Roger W. Kelm, New Richmond, Wis., and Vernon L. Herting, Andover, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 155,404, Nov. 19, 1993. This application Apr. 27, 1995, Ser. No. 429,986

Int. Cl.[6] H01M *6/00*

U.S. Cl. 29—623.1 **8 Claims**



1. A method for making an electrode assembly for an electrochemical cell comprising the steps of:

(a) providing an anode comprising an elongated strip of alkali metal;

(b) pressing a porous separator material into the strip of alkali metal;

(c) providing a cathode assembly comprising a metal strip with a reactive cathode material bonded to the metal strip; and

(d) winding the anode and the cathode assembly together in an elongated unidirectional winding by the steps of:

(1) placing a mandrel having opposing flat sides with one of the flat sides contacting one side of the cathode assembly such that the contacting flat side of the mandrel is aligned with an end of the cathode assembly;

(2) placing the anode against the cathode assembly on a side of the cathode assembly opposite to that against the mandrel such that a first end of the anode extends beyond the end of the cathode assembly substantially the same amount as the length of the opposing flat side of the mandrel;
(3) bending the anode over the end of the cathode assembly and over the end of the mandrel such that the first end of the anode is brought against the opposing flat side of the mandrel;
(4) bending both the anode and cathode assembly around the mandrel until the cathode assembly rests against the first end of the anode;
(5) continuing to wind the anode and cathode assembly together around the mandrel in the same direction while maintaining flat sides on the resulting winding until a second end of the anode is brought against the winding until a second end of the anode is brought against the winding; and
(6) removing the mandrel from the completed winding.

5,486,216

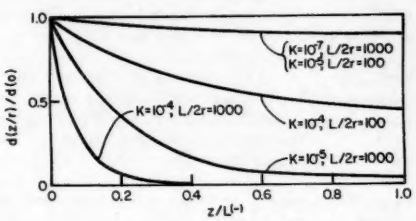
COKE HAVING ITS PORE SURFACES COATED WITH CARBON AND METHOD OF COATING

Yoshihito Shigeno, Wakabayashi, Japan, and James W. Evans, Alameda County, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 228,723, Apr. 18, 1994, abandoned, which is a continuation of Ser. No. 893,505, Jun. 4, 1992, abandoned. This application Jan. 6, 1995, Ser. No. 370,215

Int. Cl.[6] C10L *5/32*

U.S. Cl. 44—591 **10 Claims**



1. The method of treating coke having large pores with radii greater than 10 μm and small pores with radii less than 10 μm throughout the coke after it is processed to improve its oxidation resistance characteristics which comprises the steps of:
infiltrating substantially all the pores of the coke with a hydrocarbon gas, and
cracking the hydrocarbon to form a carbon deposit on the surface of substantially all of the pores, said deposit coating substantially all of the pores and substantially closing the entrance to the small pores, thereby decreasing the surface area of the small pores as compared to the large pores to thereby reduce the oxidation rate of the coke.

5,486,217

CELLULOSIC COMPOSITION

Brent G. Biehl, P.O. Box 30 B, and Michael J. Biehl, P.O. Box 81, both of Paradise, Mich. 49768

Filed Oct. 23, 1992, Ser. No. 965,499

Int. Cl.[6] C10L *5/06;5/40*

U.S. Cl. 44—597 **20 Claims**

1. A method for making a cellulosic composition, said method comprising the steps of:
obtaining a quantity of cellulosic particles having a certain moisture content;
heating said quantity of cellulosic particles, effective to remove a certain and predetermined amount of said moisture content therefrom;
pulverizing said partially dried particles;
heating said pulverized and partially dried particles effective to remove a second certain and predetermined amount of said moisture content;
compacting and heating said heated and pulverized particles with a predetermined and certain temperature and with a certain and predetermined compacting force;
separating said heated and pulverized particles into a first group of dust particles and a second group of coarse particles as said heated and pulverized particles are heated to remove said second and predetermined amount of said moisture content;
mixing said separated dust particles with said separated coarse particles; and
compacting said mixed dust particles and said coarse particles with a second compacting force effective to produce said cellulosic composition.

5,486,218

OXYGENATED ANALOGS OF BOTANIC SEED

William C. Carlson, Olympia; Jeffrey E. Hartle, Federal Way, both of Wash., and Barbara K. Bower, Hot Springs, Ark., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 604,656, Oct. 26, 1990, Pat. No. 5,236,469. This application Jun. 1, 1993, Ser. No. 69,560

The portion of the term of this patent subsequent to Aug. 17, 2010, has been disclaimed.

Int. Cl.[6] A01C *1/00;1/06;* **A01H** *5/10*

U.S. Cl. 47—57.6 **24 Claims**

1. An analog of a botanic seed comprising totipotent plant tissue encapsulated in a substantially non-phytotoxic hydrated gel, the hydrated gel comprising a perfluorocarbon compound so as to enable the gel to absorb or carry molecular oxygen and thereby produce a concentration of molecular oxygen in the gel that is higher than a concentration of molecular oxygen that would otherwise be present in a hydrated gel, that lacks the perfluorocarbon compound, solely by absorption of oxygen from the atmosphere at standard temperature and pressure, the higher concentration of molecular oxygen in the hydrated gel allowing the seed analog to exhibit a higher germination rate than exhibited by an otherwise similar control seed analog lacking the higher concentration of molecular oxygen.

5,486,219

COATABLE UREA-ALDEHYDE SOLUTIONS CONTAINING A COCATALYST, COATED ABRASIVES MADE USING SAID SOLUTIONS, AND METHOD OF MAKING COATED ABRASIVES

Jeffrey E. Ford, Woodbury; Ellen Y. Chu, Stillwater, and Harold E. Rude, Roseville, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 945,126, Sep. 15, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 300,854

Int. Cl.[6] C09K *3/14*

U.S. Cl. 51—298 **25 Claims**

1. A coated abrasive having a binder and abrasive particle attached to a backing, at least one layer of the binder comprises a cured urea-aldehyde binder, the cured urea-aldehyde binder derived from a coatable urea-aldehyde binder precursor composition comprising a urea-aldehyde resin and a cocatalyst, the urea-aldehyde resin having a aldehyde/urea mole ratio ranging from about 1.0 to about 2.0 and a free aldehyde content ranging from about 0.1 to about 1.0 weight percent based on weight of total aldehyde, said cocatalyst consisting essentially of a Lewis acid and a salt, said salt selected from the group consisting of organic amine salts and ammonium ion salts.

5,486,220

EXHAUST GAS PURIFICATION FILTER

Masaaki Honda, and Tomohiko Ihara, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Jun. 6, 1994, Ser. No. 254,169

Claims priority, application Japan, Jun. 18, 1993, 5-172366

Int. Cl.[6] B01D *39/20*

U.S. Cl. 55—487 6 Claims

1. An exhaust gas purification filter comprising a porous body obtained by packing and fixing fibers formed of a metal, excluding metal oxides and ceramics, and having a mean fiber diameter of 5 to 40 μm in a dispersed state, into pores of a foamed structure porous body made of a heat-resistant metal, excluding metal oxides and ceramics, whereby a packing density of said porous body is 5 to 20%.

5,486,221

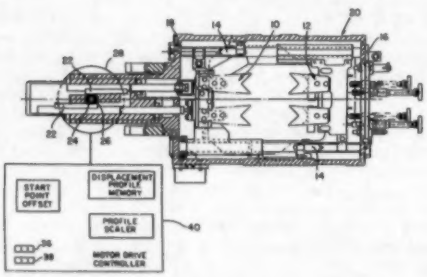
SHEAR MECHANISM FOR GLASS FORMING MACHINE

Marty J. Grant, Kensington, and Steven J. Pinkerton, Avon, both of Conn., assignors to Emhart Glass Machinery Investments Inc., Wilmington, Del.

Filed Dec. 24, 1991, Ser. No. 814,121

Int. Cl.[6] C03B *7/10;* B26D *5/08*

U.S. Cl. 65—163 3 Claims



1. A shear mechanism for shearing discrete gobs from at least one runner of molten glass comprising

a pair of opposed shear assemblies mounted for reciprocating displacement,

means for conjointly displacing said shear assemblies including a servo motor,

means for controlling the operation of said servo motor including

means for storing a displacement profile for displacing said shear assemblies a predetermined stroke from a retracted location to an advanced shearing location,

means for determining whether the cycle rate of said shear assemblies is above or below a selected rate,

means for scaling said displacement profile by a selected percentage when cycle rate exceeds said selected rate so that said shear assemblies will be displaced a stroke which is said selected percentages of said predetermined stroke, and

means for relocating said retracted location by the difference between the length of said predetermined and scaled strokes to maintain said advanced shearing location.

5,486,222

SINTERED COMPOSITE MATERIALS FOR ELECTRIC CONTACTS IN POWER TECHNOLOGY SWITCHING DEVICES AND PROCESS FOR PRODUCING THEM

Franz Hauner, Röttenbach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE93/00052, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO93/15517, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 22, 1993, Ser. No. 256,643

Claims priority, application Germany, Jan. 24, 1992, 42 01 940.0

Int. Cl.[6] C22C *29/12*

U.S. Cl. 75—232 18 Claims

1. A sintered composite material for electric contacts comprising an $AgSnO_2Bi_2O_3CuO$ base composition with a separately added metal oxide selected from stannic oxide (SnO_2), an oxide of iron and at least one element from group VIB of the periodic table of elements, and a mixture of stannic oxide and an oxide of iron and at least one element from group VIB of the periodic table of elements.

5,486,223

METAL MATRIX COMPOSITIONS AND METHOD OF MANUFACTURE THEREOF

Robin A. Carden, Costa Mesa, Calif., assignor to Alyn Corporation, Costa Mesa, Calif.

Filed Jan. 19, 1994, Ser. No. 183,728

Int. Cl.[6] C22C *29/14;29/16*

U.S. Cl. 75—244 10 Claims

1. An improved metal matrix composite comprising:

a base material metal and boron carbide in a ratio of approximately between 6 and 10 to 1 by weight, the boron carbide being substantially homogeneously distributed among the metal, forming close grain boundaries therewith; and less than about 1.5% by weight of at least one metal additive having an inter-metallic phase temperature lower than the melting point of said base material metal, said metal additive being added to the boron carbide during its production to provide a chelating opportunity for the base material metal.

5,486,224

POWDER MIXTURE FOR USE IN COMPACTION TO PRODUCE RARE EARTH IRON SINTERED PERMANENT MAGNETS

Yoshihisa Kishimoto, Ikoma; Nobushige Hiraishi; Wataru Takahashi, both of Nishinomiya; Masakazu Ohkita, Ashiya; Naoyuki Ishigaki, Otsu, and Yutaka Matsuura, Hyogo, all of, Japan, assignors to Sumitomo Metal Industries, Ltd., and Sumitomo Special Metals Co., Ltd., both of Osaka, Japan

Filed Dec. 27, 1994, Ser. No. 364,315

Claims priority, application Japan, Dec. 28, 1993, 5-335406; Jan. 19, 1994, 6-253904

Int. Cl.[6] B22F *1/00*

U.S. Cl. 75—254 23 Claims

1. A powder mixture for use in compaction to produce rare earth iron sintered permanent magnets, which consists essentially of a fine R—Fe—B alloy powder and at least one boric acid ester compound substantially uniformly mixed with the alloy powder, the R—Fe—B alloy powder being comprised predominantly of 10–30 atomic % of R (wherein R stands for at least one elements selected from rare earth elements including yttrium), 2–28 atomic % of B, 65–82 atomic % of Fe, and 0 to 41 atomic % of Co.

5,486,225

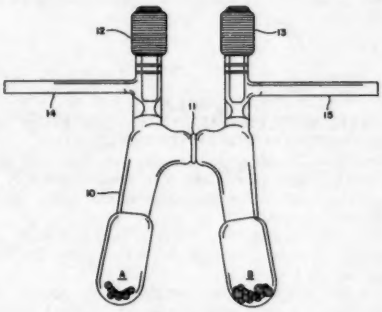
PROCESS FOR PRODUCING AN ALLOY

James L. Dye, East Lansing; Ahmed S. Ellaboudy, Midland, and Kuo-Lih Tsai, East Lansing, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Division of Ser. No. 950,290, Sep. 24, 1992, abandoned, which is a division of Ser. No. 522,661, May 11, 1990. This application Apr. 4, 1994, Ser. No. 222,637

Int. Cl.[6] C22B *3/44*

U.S. Cl. 75—351 10 Claims



1. A process for the production of an alloy which comprises:

reducing in a reaction mixture a first metal salt containing a first metal and a second metal salt containing a second metal different from the first metal with a reducing agent selected from the group consisting of an electride and an alkalide in an organic solvent and in the absence of an oxidizing atmosphere to produce a first and second metal compound as an alloy of the first and second metals in finely divided form.

5,486,226

SEPARATION OF GASEOUS MIXTURES

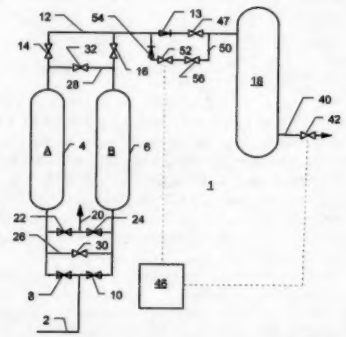
Ian A. Ross, Guildford, and Michael B. Pooley, New Milton, both of, England, assignors to The BOC Group plc, Windlesham, England

Filed Dec. 8, 1993, Ser. No. 164,088

Claims priority, application United Kingdom, Dec. 9, 1992, 9225680

Int. Cl.[6] B01D *53/053*

U.S. Cl. 95—11 6 Claims



1. A method of producing a product gas from a feed gas mixture including the product gas by pressure swing adsorption, which method comprises repeatedly performing the following sequence of steps:

a) passing the feed gas mixture into one end region of a bed of adsorbent material that adsorbs preferentially at least one other component of the gas mixture relative to the product gas;

b) withdrawing from the opposite end of the bed the product gas and passing said product gas into a receiver vessel;

c) desorbing said at least one other component of the feed gas mixture from the adsorbent bed by placing the adsorbent bed in communication with atmosphere or with a vacuum; and in that, the level of purity of the product gas is sensed so that when it falls below a predetermined level the product gas is passed back from the receiver vessel into the bed of adsorbent material during a back-fill step.

5,486,227

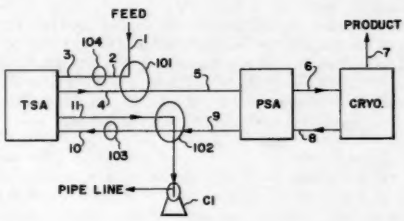
INTEGRATED PROCESS FOR PURIFYING AND LIQUEFYING A FEED GAS MIXTURE WITH RESPECT TO ITS LESS STRONGLY ADSORBED COMPONENT OF LOWER VOLATILITY

Ravi Kumar, Allentown; Eric W. Scharpf, Emmaus, and Charles M. Woods, Germansville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 132,397, Oct. 6, 1993, abandoned. This application Dec. 8, 1994, Ser. No. 352,256

Int. Cl.[6] B01D *53/047*

U.S. Cl. 95—41 6 Claims



1. Regarding a feed gas mixture consisting of a strongly adsorbed component, a moderately strongly adsorbed component, a first less strongly adsorbed component, and a second less strongly adsorbed component of lower volatility than the first less strongly adsorbed component, a process for purifying and liquefying the feed gas mixture with respect to the second less strongly adsorbed component comprising the steps of:

(a) passing the feed gas mixture through a temperature swing adsorption bed containing an adsorbent selective for the retention of the strongly adsorbed component to produce an adsorption bed saturated with the strongly adsorbed component and a temperature swing effluent stream enriched in the moderately strongly adsorbed component, the first less strongly adsorbed component and the second less strongly adsorbed component;

(b) regenerating the temperature swing adsorption bed wherein said regenerating in this step (b) comprises the steps of:

(1) heating the temperature swing adsorption bed by heating a first regeneration gas and subsequently passing the heated first regeneration gas through the temperature swing adsorption bed in order to vaporize and desorb at least a portion of the strongly adsorbed component from the temperature swing adsorption bed; and

(2) cooling the temperature swing adsorption bed to the temperature of the temperature swing adsorption bed in step (a) by passing a second regeneration gas through the adsorption bed;

(c) passing the temperature swing effluent stream through a pressure swing adsorption bed containing an adsorbent selective for the retention of the moderately strongly adsorbed component to produce an adsorption bed saturated with the moderately strongly adsorbed component and a pressure

swing effluent stream enriched in the first less strongly adsorbed component and the second less strongly adsorbed component;

(d) regenerating the pressure swing adsorption bed wherein said regenerating in this step (d) comprises the steps of:

(1) depressurizing the pressure swing adsorption bed to produce a depressurization effluent stream enriched in the moderately strongly adsorbed component wherein a first portion of said depressurization effluent stream is used as at least a portion of the first regeneration gas in step (b)(1) and wherein a second portion of said depressurization effluent stream is used as at least a portion of the second regeneration gas in step (b)(2); and

(2) repressurizing the pressure swing adsorption bed to the pressure of the pressure swing adsorption bed in step (c) with a third regeneration gas;

(e) passing the pressure swing effluent stream into a distillation column to produce an overhead stream enriched in the first less strongly adsorbed component and a liquid bottoms stream enriched in the second less strongly adsorbed component wherein at least a portion of said overhead stream is used as at least a portion of the third regeneration gas in step (d)(2).

5,486,228

WASHABLE COLOR CHANGING COMPOSITIONS

Richard E. Miller, Nazareth, Pa.; Charlene R. Couch, Richmond, Va., and Cheryl D.. Krieger, Bangor, Pa., assignors to Binney & Smith Inc., Easton, Pa.

Continuation-in-part of Ser. No. 89,503, Jul. 16, 1993, Pat. No. 5,326,388, and Ser. No. 78,722, Jun. 16, 1993, Pat. No. 5,352,282, which is a continuation of Ser. No. 923,308, Jul. 31, 1992, Pat. No. 5,232,494, said Ser. No. 89,503is a continuation-in-part of Ser. No. 923,308, Jul. 31, 0. This application Jul. 5, 1994, Ser. No. 270,485

Int. Cl.[6] C09D *11/02*

U.S. Cl. 106—22 B **52 Claims**

1. A washable multiple coloring composition system comprising:

(a) an undercolor aqueous coloring composition comprising a compatible surfactant in an amount sufficient to provide washability to said undercolor aqueous coloring composition and an undercolor dye whose coloring ability is destroyed in the presence of a pH of about 10 or greater; and

(b) an overcolor aqueous coloring composition comprising a compatible surfactant in an amount sufficient to provide washability to said overcolor aqueous coloring composition, a colorant capable of maintaining its characteristic color in the presence of a pH of about 10 or greater and an effective amount of a base sufficient to yield a pH of said overcolor aqueous coloring composition of about 10 or greater.

5,486,229

RAW MATERIAL FOR PRODUCING FERRITE DUST FOR FRICTION ELEMENTS AND METHOD OF REDUCING THE SAME

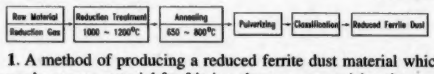
Ki Ju An, Sunchun, Rep. of Korea, assignor to Kumsan Material Co., Ltd., Chonlla Nam-Do, Rep. of Korea

Filed Jul. 29, 1993, Ser. No. 99,222

Claims priority, application Rep. of Korea, Jul. 29, 1992, 92-13577; Jul. 30, 1992, 92-13678

Int. Cl.[6] C09K *3/14;* **C22B** *5/18*

U.S. Cl. 106—36 **4 Claims**



1. A method of producing a reduced ferrite dust material which is used as a raw material for friction elements, comprising the steps of:

providing a sludge containing solids consisting essentially of 35 to 50% total Fe including Fe in iron oxides and no more than 2% metallic Fe, 1.0 to 8.0% SiO_2, 0.3 to 2.5% MgO, 1.0 to 6.0% CaO, 1.0 to 5.0% Al_2O_3, 20 to 40% fixed carbon, and 0.1 to 1.0% ZnO, all percentages being based on percentages by weight, said sludge having grain size of 20 to 250 mesh, apparent specific gravity of 1.2 to 2.0 g/cc, real specific gravity of 3.3 to 4.3 g/cc, and porosity of 40 to 65% measured by a mercury porosimeter;

treating the sludge under reduction conditions by exposing the sludge to a reduction gas at a charge rate of 8 to 20 Nl/min., a reduction temperature of 1,000° to 1,200° C., a reduction time to 20 to 60 minutes and a reduction gas-to-solid material ratio of 0.5 to 2.5; and

annealing the reduced sludge at an annealing temperature of 650° to 800° C.

5,486,230

STABLE MOULDING MATERIAL AND SPINNING MATERIAL CONTAINING CELLULOSE

Wolfram Kalt, Lenzing; Johann Männer, Weyregg; Dieter Eichinger, Vöcklabruck, and Christoph Schrempf, Bad Schallerbach, all of, Austria, assignors to Lenzing Aktiengesellschaft, Austria

PCT No. PCT/AT94/00055, § 371 Date Dec. 6, 1994, § 102(e) Date Dec. 6, 1994, PCT Pub. No. WO94/25492, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 29, 1994, Ser. No. 351,466

Claims priority, application Austria, May 5, 1993, A886/93

Int. Cl.[6] C09D *101/24;101/22;101/08;101/00*

U.S. Cl. 106—165 **5 Claims**

1. A stable composition for moulding or spinning containing cellulose, a tertiary amine-oxide, particularly N-methylmorpholine-N-oxide, and a stabiliser, and optionally water, characterized in that as said stabiliser a mixture of glucosides of gallic acid and m-digallic acid is provided.

5,486,231

WATER REPELLENT SOLUTION FOR WOOD AND METHOD

Donald C. Dulaney, 5109 Comanche Way, Madison, Wis. 53704

Filed May 2, 1994, Ser. No. 236,329

Int. Cl.[6] C09K *3/18;* **C09D** *191/00;7/12*

U.S. Cl. 106—243 **23 Claims**

1. A water repellent solution having a long shelf life and that is suitable for treatment of wood, the solution comprising:

an organo-metallic complex of a hydrophobic fatty acid coordinated with a halogenated trivalent chromium; and

water having a pH reduced by a pH reducing component that is distinct from the organo-metallic complex and that is a strong reducing acid.

5,486,232

GLASS FIBER TACKING AGENT AND PROCESS

Edward J. Griffith, Manchester, and Toan M. Ngo, Eureka, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 8, 1994, Ser. No. 287,037

Int. Cl.[6] C09D *1/00*

U.S. Cl. 106—286.5 **24 Claims**

1. A process for preparing a tacking agent useful as a glass fiber tacking agent which comprises:

a. forming a first composition comprising an aqueous solution of aluminum orthophosphate;

b. forming a second composition comprising a condensed covalently bonded phosphate polymer and;

c. combining said first and second compositions whereby the amount of condensed phosphate polymer in the resulting composition comprises from about 25 to about 75 percent by weight of the total phosphate and the Al:P molar ratio is less than 1.

5,486,233

PIGMENT EXTENDERS

Lance S. Mitchell, Mount Hawthorn, Australia; Mary Ann Nordhauser, Franklin Lakes, N.J., and Justin M. Willis, Dalkeith, Australia, assignors to Western Mining Corporation Limited, Melbourne, Australia

Filed Oct. 28, 1993, Ser. No. 141,953
Int. Cl.[6] A61K 7/035; C07C 3/08
U.S. Cl. 106—416 22 Claims

1. A powdered pigment composition for application to the skin including

finely divided, hydrophobic pigment extender particles; and

optionally finely divided, hydrophobic pigment particles;

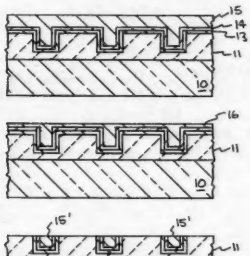
and wherein the pigment extender particles and optional pigment particles are coated by a coating of non-hydrogenated, amphiphilic, lecithin phospholipid material, and a surface modifying agent selected from the group consisting of fatty acids, fatty acid esters, fatty acid triglycerides, and mixtures thereof, said coating having a weight percent composition of greater than 50% phospholipid material, said coated pigment extender having an increased hydrophilicity permitting said phospholipids to be adsorbed by the skin of a user.

5,486,234

REMOVAL OF FIELD AND EMBEDDED METAL BY SPIN SPRAY ETCHING

Robert J. Contolini, Pleasanton; Steven T. Mayer, San Leandro, and Lisa A. Tarte, Livermore, all of Calif., assignors to The United States of America as represented by The United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 92,090, Jul. 16, 1993, abandoned.
This application Jan. 19, 1995, Ser. No. 375,054
Int. Cl.[6] H01L 21/00
U.S. Cl. 216—91 20 Claims



1. A process for uniformly removing metal from a metal surface located on a substrate surface and from a metal surface located above metal containing trenches formed in the substrate for producing an essentially planar surface across the substrate and the metal containing trenches therein, comprising:

providing an etchant capable of etching the metal;

rotating the substrate; and

directing the etchant onto the metal surfaces.

5,486,235

PLASMA DRY CLEANING OF SEMICONDUCTOR PROCESSING CHAMBERS

Yan Ye, Campbell; Charles S. Rhoades, Los Gatos, and Gerald Z. Yin, Cupertino, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Aug. 9, 1993, Ser. No. 104,318
Int. Cl.[6] B08B 7/00
U.S. Cl. 134—1.1 2 Claims

1. A method for the plasma cleaning of surfaces of a semiconductor process chamber having involatile contaminants deposited thereon, said process comprising the steps of:

(a) removing any semiconductor workpiece present from said semiconductor process chamber;

(b) placing a non-gaseous source of reactive-species-generating material within said processing chamber, at a location which had been occupied by a workpiece during processing of said workpiece;

(c) exposing said non-gaseous source of reactive-species-generating material to a plasma generated from a gas fed into said processing chamber, whereby volatile reactive species are generated; and

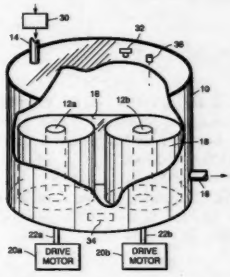
(d) contacting said surfaces of said semiconductor processing chamber with a plasma comprising said volatile reactive species generated in step (c) from said non-gaseous source, whereby at least a portion of said involatile contaminants residing on said surfaces are converted to volatile molecules.

5,486,236

ACCELERATED EXTRACTION OF ROLLED MATERIALS

Carl W. Townsend, and Edna M. Purer, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 6, 1994, Ser. No. 239,057
Int. Cl.[6] B08B 1/02; 1/04; 3/10; 3/12
U.S. Cl. 134—13 12 Claims



1. A process for removing undesired constituents from a chosen material, comprising the steps of:

(a) placing a first roll comprising multiple single layers of said material containing said undesired constituents in a cleaning chamber for containing cleaning fluid wherein cleaning takes place;

(b) providing a means for unrolling said material from said first roll and re-rolling said material onto a second roll, wherein said first and second rolls are located within said cleaning chamber;

(c) introducing into said cleaning chamber said cleaning fluid comprising either a liquefied gas or a supercritical fluid and contacting said first roll of said material containing said undesired constituents with said cleaning fluid; and

(d) unrolling said material containing said undesired constituents from said first roll and re-rolling said material onto said second roll in said cleaning chamber while exposing single layers of said material containing said undesired constituents and said first and second rolls to said cleaning fluid for a period of time sufficient to remove said undesired constituents

from said material and to provide cleaning fluid containing said undesired constituents.

5,486,237

POLYSILICON THIN FILM AND METHOD OF PREPARING POLYSILICON THIN FILM AND PHOTOVOLTAIC ELEMENT CONTAINING SAME

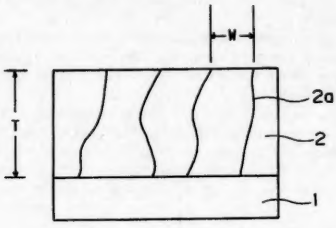
Keiichi Sano, and Yoichiro Aya, both of Moriguchi, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jun. 22, 1994, Ser. No. 263,528

Claims priority, application Japan, Jun. 24, 1993, 5-153692

Int. Cl.[6] H01L *31/04;31/0392;31/0368*

U.S. Cl. 136—258 **31 Claims**



10. A photovoltaic element comprising: a substrate; a polysilicon thin film obtained by forming an amorphous silicon thin film on said substrate and crystallizing said amorphous film through heat treatment, wherein said polysilicon thin film has a thickness of at least 3 μm, and has crystal grains with an inplane crystal width in the plane of said thin film of about 0.1 to about 1 times said thickness, and wherein substantially all grain boundaries of said crystal grains extend substantially in the direction of said thickness; and a semiconductor layer forming a semiconductor junction with said polysilicon thin film.

5,486,238

PHOTOVOLTAIC DEVICE

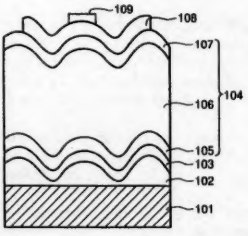
Katsumi Nakagawa, and Noboru Toyama, both of Nagahama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 964,284, Oct. 21, 1992, abandoned. This application Nov. 21, 1994, Ser. No. 347,204

Claims priority, application Japan, Jan. 22, 1991, 3-273974

Int. Cl.[6] H01L *31/04;31/0224;31/0232*

U.S. Cl. 136—259 **14 Claims**



1. A photovoltaic device comprising a metal layer, a transparent conductive layer formed on said metal layer, and a semiconductor layer provided on said transparent layer and capable of photoelectric conversion, wherein said metal layer is composed of aluminum containing at least one element selected from copper, zinc, and manganese.

5,486,239

METHOD OF MANUFACTURING MAGNETICALLY ANISOTROPIC R-T-B-M POWDER MATERIAL AND METHOD OF MANUFACTURING ANISOTROPIC MAGNETS USING SAID POWDER MATERIAL

Ryoji Nakayama; Takuo Takeshita, and Yoshinari Ishill, all of Saitama, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Oct. 29, 1993, Ser. No. 145,956

Claims priority, application Japan, Jan. 29, 1992, 4-314202

Int. Cl.[6] H01F *1/03*

U.S. Cl. 148—101 **19 Claims**

1. A method of manufacturing a magnetically anisotropic R-T-B-M powder material for an R-T-B-M anisotropic magnet having a recrystallized fine aggregate structure of an $R_2T_{14}B$ intermetallic compound phase comprising:

providing an R-T-B-M raw alloy material, in one of a hydrogen atmosphere, a mixed hydrogen/inert gas atmosphere, a vacuum atmosphere and an inert gas atmosphere, having a c-axis crystal orientation of an $R_2T_{14}B$ intermetallic compound phase consisting of, as main components, at least one of a rare-earth element including Y (hereinafter referred to as "R"), one of a Fe and a component obtained by partially substituting Fe with Co (hereinafter referred to as "T"), and B;

said R-T-B-M raw alloy material being of a main phase that is an $R_2T_{14}B$ intermetallic compound phase containing one or more of Si, Ga, Zr, Nb, Mo, Hf, Ta, W, Al, Ti and V (hereinafter referred to as "M") in an amount of from 0.001 to 5.0 atomic %;

one of heating said R-T-B-M raw alloy material from the room temperature up to 500° C. in said atmosphere, and maintaining said R-T-B-M raw material alloy at a temperature not exceeding 500° C. for about one hour after heating;

further heating said R-T-B-M raw alloy material in a hydrogen atmosphere or a mixed hydrogen/inert gas atmosphere up to a temperature ranging from 500° to 1,000° C., and maintaining said raw alloy material at said temperature for a time sufficient to cause said R-T-B-M raw alloy material to occlude hydrogen;

maintaining said further heated R-T-B-M raw alloy material in a vacuum atmosphere of up to 1 Torr at a temperature for a time sufficient to cause said R-T-B-M raw alloy material to release hydrogen; and

cooling and crushing said vacuum maintained R-T-B-M raw alloy material to form a magnetically anisotropic R-T-B-M powder material.

5,486,240

CARBIDE/NITRIDE GRAIN REFINED RARE EARTH-IRON-BORON PERMANENT MAGNET AND METHOD OF MAKING

R. William McCallum, and Daniel J. Branagan, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Apr. 25, 1994, Ser. No. 232,837

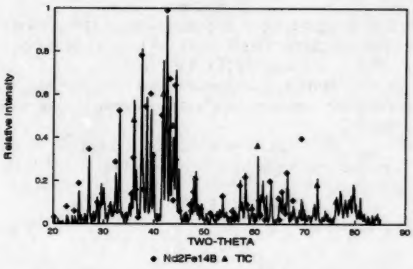
Int. Cl.[6] H01F *1/057*

U.S. Cl. 148—102 **13 Claims**

1. A method of making a permanent magnet having a base alloy composition comprising RE, at least one of Fe and Co, and B wherein RE is one or more rare earth elements, comprising:

a) forming a melt having said base alloy composition in which TR, where TR is a transition metal selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, and Al and at least one of C and N are provided as additives to form upon melt solidification a compound that is more thermodynamically stable than a compound otherwise formable between the additives and the base alloy components, whereby the base alloy components are not involved in formation of said compound,

b) rapidly solidifying the melt in a manner to form particulates having at least one of a substantially amorphous structure and



micro-crystalline structure, including forming primary precipitates comprising said compound by reaction of said TR and said at least one of said C and N, said precipitates being dispersed in said structure,

c) heating the solidified particulates above the crystallization temperature of the base alloy composition to improve a magnetic property of said structure, including forming secondary precipitates comprising said compound at grain boundaries by reaction of said TR and said at least one of said C and N, and

d) consolidating the particulates at an elevated temperature, said precipitates resisting grain growth in said structure at said elevated temperature.

5,486,241

NON-AGING AT ROOM TEMPERATURE FERRITIC SINGLE-PHASE COLD-ROLLED STEEL SHEET AND HOT-DIP GALVANIZED STEEL SHEET FOR DEEP DRAWING HAVING EXCELLENT FABRICATION EMBRITTLEMENT RESISTANCE AND PAINT-BAKE HARDENABILITY AND PROCESS FOR PRODUCING THE SAME

Kohsaku Ushioda; Naoki Yoshinaga; Yoshikazu Matsumura; Osamu Akisue, all of Futtsu; Kunio Nishimura, and Hidekuni Murakami, both of Kitakyusyu, all of, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

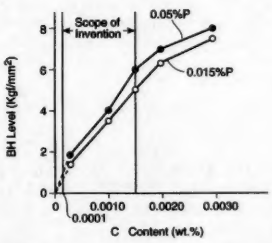
PCT No. PCT/JP93/01314, § 371 Date Jun. 29, 1994, § 102(e) Date Jun. 29, 1994, PCT Pub. No. WO94/06948, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 14, 1993, Ser. No. 240,782

Claims priority, application Japan, Sep. 14, 1992, 4-245306; Sep. 14, 1992, 4-245307; Jan. 20, 1993, 5-007817; Mar. 19, 1993, 5-060782

Int. Cl.[6] C22C *38/06;* C21D *8/02*

U.S. Cl. 148—330 **14 Claims**



1. A non-aging at room temperature ferritic single-phase cold-rolled steel sheet for deep drawing having excellent fabrication embrittlement resistance and paint-bake hardenability, comprising, in terms of % by weight, 0.0001 to 0.0015% of C, not more than 1.2% of Si, 0.03 to 3.0% of Mn, 0.01 to 0.15% of P, 0.0010 to 0.020% of S, 0.005 to 0.1% of Al, 0.0001 to 0.0080% of N and 0.0001 to 0.0030% of B with the balance consisting of Fe and unavoidable impurities, said fabrication embrittlement resistance of said steel sheet being a ductility-embrittlement transition temperature of −55° C. or below.

5,486,242

NIOBIUM OR TANTALUM BASED HIGH SPECIFIC STRENGTH INTER METALLIC COMPOUNDS AND ALLOYS

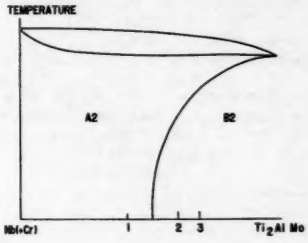
Shigehisa Naka; Tasadduq Khan, both of Jouy-en-Josas; André Walder, L'Hay les Roses; Michel Marty, Buc; Christophe Delaunay, Paris, and Pierre Thevenin, Evry, all of, France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon Cedex, France

Continuation of Ser. No. 340,446, Nov. 14, 1994, abandoned, which is a continuation of Ser. No. 50,245, Jul. 16, 1993, abandoned. This application May 15, 1995, Ser. No. 440,659

Claims priority, application France, Nov. 26, 1990, 90 14760

Int. Cl.[6] C22C *27/02*

U.S. Cl. 148—422 **4 Claims**



1. Niobium-based alloy made up entirely of a crystalline medium exhibiting a substantially continuous centered cubic structure, comprising an intermetallic compound of formula Ti_2AlMo, and having a composition on an atomic basis in the following domain:

Nb + Cr	20 to 40%
Cr	0 to 5%
Ti	30 to 40%
Al	15 to 20%
Mo	15 to 20%,

the ratio Ti:Al:Mo being approximately 2:1:1, and the concentration of Nb being not more than 37%.

5,486,243

METHOD OF PRODUCING AN ALUMINUM ALLOY SHEET EXCELLING IN FORMABILITY

Koichi Hashiguchi; Yoshihiro Matsumoto; Makoto Imanaka; Takaaki Hira; Rinsei Ikeda; Naoki Nishiyama; Nobuo Totsuka, all of Chiba; Yoichiro Bekki, and Motohiro Nabae, both of Tokyo, all of, Japan, assignors to Kawasaki Steel Corporation, and The Furukawa Electric Co., Ltd., Japan

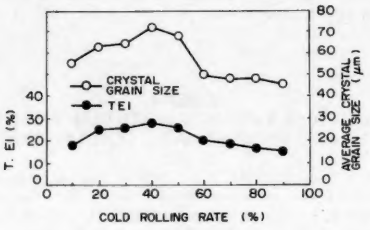
Filed Oct. 12, 1993, Ser. No. 135,260

Claims priority, application Japan, Jan. 13, 1992, 4-274044; Aug. 10, 1993, 5-198207

Int. Cl.[6] C22F *1/04*

U.S. Cl. 148—552 **11 Claims**

1. A method of producing aluminum alloy sheets having satisfactory formability, said method comprising the steps of: preparing aluminum scrap consisting essentially of a total of about 0.3 to 2.0 wt % of Fe and Si, and the balance Al except for incidental impurities; melting the prepared scrap and then adjusting its composition to attain an Mg content of about 3 to 10 wt %; subjecting the resulting material to hot rolling, cold rolling at a total reduction of about 20 to 50% and continuous annealing; and applying a



lubricant surface coating so as to impart to the resulting material a sliding resistance of not more than about 0.11.

5,486,244

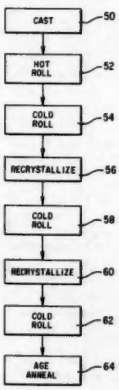
PROCESS FOR IMPROVING THE BEND FORMABILITY OF COPPER ALLOYS

Ronald N. Caron, Branford, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 135,760, Oct. 18, 1993, Pat. No. 5,370,840, which is a continuation of Ser. No. 971,499, Nov. 4, 1992, Pat. No. 5,306,465. This application Apr. 25, 1994, Ser. No. 233,147

Int. Cl.[6] C22F *1/08*

U.S. Cl. 148—554 **9 Claims**



1. A method for the manufacture of a copper alloy, comprising the steps of:

a) casting a precipitation hardenable copper alloy containing from about 0.001% to about 2.0% by weight chromium and from about 0.001% to about 2.0% by weight zirconium;

b) heating said copper alloy for at least partial homogenization;

c) hot rolling said copper alloy to an area reduction in excess of about 50%;

d) cold rolling said copper alloy to an area reduction in excess of about 25%;

e) recrystallizing said copper alloy for a first time;

f) cold rolling said copper alloy to a cross sectional area reduction of from about 40% to about 90%;

g) recrystallizing said copper alloy for a second time at a temperature effective to produce the desired aging response during precipitation aging;

h) cold rolling said copper alloy to final gauge; and

i) precipitation aging said copper alloy.

5,486,245

METHOD FOR RAISING WELDED RAIL CONNECTIONS LYING BELOW THE TRAVELING SURFACE ON RAILROAD TRACKS

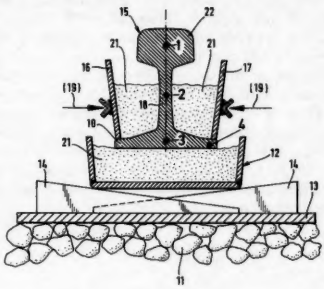
Gerhardus J. Mulder, Essen, and Frank Kuster, Ratingen, both of, Germany, assignors to Elektro-Thermit GmbH, Essen, Germany

Filed Jun. 9, 1994, Ser. No. 257,613

Claims priority, application Germany, Jun. 11, 1993, 43 19 416.8

Int. Cl.[6] C21D *9/04*

U.S. Cl. 148—582 **3 Claims**



1. Method of raising of rail joint welds which lie below a traveling surface of railroad tracks, by heating a weld with an ignited aluminothermic mixture which solidifies after reacting, said method comprising the steps of:

providing the aluminothermic mixture in an amount that, measured in kilograms, is equal to from one-fifth to one-tenth of the weight per meter of the rail, likewise measured in kilogram;

distributing the aluminothermic mixture so that a rail base is heated by using 30 to 60% of the aluminothermic mixture, and a rail web is heated by using a remaining amount of the aluminothermic mixture evenly distributed on both sides of the rail web;

igniting the aluminothermic mixture and leaving the aluminothermic mixture on the rail for a number of minutes equal to 0.7 to 1.5 times the weight in kilograms of the amount of aluminothermic mixture, whereby, due to a pattern of distribution of the aluminothermic mixture along the rail base and the rail web, the rail base and the rail web are heated to different temperatures resulting in raising of the weld; and

removing the reacted aluminothermic mixture from the rail base and web.

5,486,246

HIGH DENSITY AMMONIUM NITRATE PRILL AND METHOD OF PRODUCTION OF THE SAME

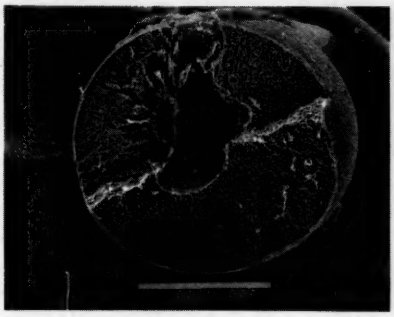
David A. Kelley, Savannah, Ga., assignor to Arcadian Fertilizer, L.P., Memphis, Tenn.

Filed Sep. 15, 1994, Ser. No. 306,824

Int. Cl.[6] C06B *45/00*

U.S. Cl. 149—2 **21 Claims**

1. A high density ammonium nitrate prill comprising a porous ammonium nitrate matrix having a density of at least about 54 pounds per cubic foot (0.86 kg/L) and a concentration of greater than about 99.5 wt.% ammonium nitrate with an alkylaryl sulfonate as an internal additive, wherein the prill has an oil absorption capacity of at least about 4 percent by weight based on the total weight of prill and oil.



5,486,247

EXPLOSIVE COMPOSITION, MANUFACTURE AND USE THEREOF

Björn Engsbråten, Dolomitvägen 8, S-703 74 Öbrebro, Sweden

Filed Feb. 4, 1993, Ser. No. 13,434
Int. Cl.[6] C06B *31/28*
U.S. Cl. 149—46 16 Claims

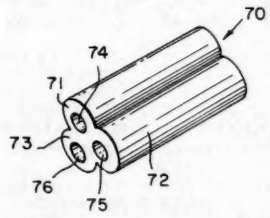
16. In a porous pulverulent explosive composition comprising free-flowing solid particles of an oxidizing agent of prilled ammonium nitrate, the improvement of providing 0.5 to 30 percent by weight of the total composition of a water-soluble hydroxyacid selected from the group consisting of malonic acid, tartaric acid, and citric acid which is capable of neutralizing liberated ammonia from within said porous pulverulent explosive composition thereby rendering said composition particularly suited for usage in a basic environment while enhancing the quality of the nearby environment.

5,486,248

EXTRUDABLE GAS GENERANT FOR HYBRID AIR BAG INFLATION SYSTEM

Robert D. Taylor, Hyrum, and Marc R. Andros, North Ogden, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed May 31, 1994, Ser. No. 251,559
Int. Cl.[6] D03D *23/00;43/00*
U.S. Cl. 149—109.6 8 Claims



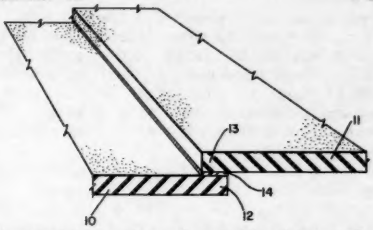
1. A method for forming a gas generant grain for an air bag inflation system, said method comprising mixing an amount of an oxidizer sufficient to convert all available carbon to carbon dioxide and all available hydrogen to water, a curing agent, and at least one thermosetting resin selected from the group consisting of an acrylate terminated polybutadiene, an ester formed by the reaction of a polybutadiene polycarboxylic acid with an epoxy modified polybutadiene, an ester formed by the reaction of a polybutadiene polycarboxylic acid with a hydroxyl-terminated polybutadiene, a styrene/polyester copolymer, and a hydroxy-terminated polybutadiene/diisocyanate reaction product, charging the mixture into an extruder in which a temperature of from about room temperature to about 200° F. is maintained, and pushing the mixture through the extruder.

5,486,249

THERMOPLASTIC FILMS FOR HEAT SEAMING ROOF SHEETING AND METHOD FOR COVERING ROOFS

Joseph K. Valaitis, Brecksville; James A. Davis, Uniontown, and Frederick Lohr, Akron, all of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 133,522, Oct. 8, 1993, abandoned, which is a division of Ser. No. 741,915, Aug. 8, 1991, Pat. No. 5,260,111. This application Dec. 5, 1994, Ser. No. 349,139
Int. Cl.[6] B32B *31/26;* C09J *5/10*
U.S. Cl. 156—71 9 Claims



1. A method for covering roofs comprising the steps of:

applying a thermoplastic film to the edge area of at least one layer of a flat rubber sheet material, said sheet material consisting essentially of a polymeric composition of matter consisting essentially of a semi-crystalline polyolefin rubber having more than about 2 percent by weight crystallinity and an ethylene content in excess of 60 percent, selected from the group consisting of ethylene-propylene copolymers and terpolymers; from about 20 to 300 parts by weight of a filler selected from the group consisting of reinforcing and non-reinforcing materials and mixtures thereof, per 100 parts of said polymer; and from about 20 to 150 parts by weight of a processing material and mixtures thereof, per 100 parts of said polymer;

applying a second layer of said flat rubber sheet material overlapping said thermoplastic film and the edge area of said first layer of flat rubber sheet material, at least one of said first and second layers of flat rubber sheet material being uncured;

heating the overlapped areas to slightly above the peak melt temperature of the thermoplastic film, said uncured layer of flat rubber sheet material remaining uncured after heating; and

seaming the overlapped area under sufficient heat and pressure for less than about 5 minutes to provide a seam, said sheet material exhibiting a seam peel adhesion value of at least 2 pounds/inch and a shear adhesion value of at least 15 pounds/square inch, in the absence of a pressure sensitive adhesive.

5,486,250

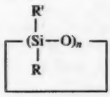
METHOD OF PREPARING FIBER REINFORCED GLASS COMPOSITES

Roger Y.-K. Leung, Schaumburg, and Stephen T. Gonczy, Mt. Prospect, both of Ill., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Oct. 25, 1989, Ser. No. 426,820
The portion of the term of this patent subsequent to Nov. 2, 2010, has been disclaimed.
Int. Cl.[6] C03B *29/00*
U.S. Cl. 156—89 4 Claims

1. A method of preparing fiber reinforced glass composites comprising:

(a) reacting (1) a cyclosiloxane monomer having the formula



where n is an integer from 3 to 30, R is hydrogen, and R' is an alkene of from 2 to 20 carbon atoms in which one vinyl carbon atom is directly bonded to silicon or (2) two or more different cyclosiloxane monomers having the formula of (1) where for at least one monomer R is hydrogen and R' is an alkyl group having from 1 to 20 carbon atoms and for the other monomers R is an alkene from 2 to 20 carbon atoms in which one vinyl carbons directly bonded to silicon and R' is an alkyl group of from 1 to 20 carbon atoms, said reaction taking place in the presence of an effective amount of hydrosilylation catalyst;

(b) applying the reaction product of (a) to at least one refractory fiber selected from the group consisting of boron, silicon carbide, graphite, silica, quartz, S-glass, E-glass, alumina, alumino silicate, boron nitride, silicon nitride, boron carbide, titanium boride, titanium carbide, zirconium oxide, and zirconium-toughened alumina to form a prepreg;

(c) laying-up plies of the prepreg of (b) to form a green structure;

(d) curing the green structure of (c) at a temperature not greater than 250° C.;

(e) pyrolyzing the cured structure of (d) at a temperature of about 800° C. to about 1400° C. in non-oxidizing atmosphere;

(f) recovering the pyrolyzed product of (e) as the fiber reinforced glass composite;

(g) impregnating the pyrolyzed product of (f) with the reaction product of (a);

(h) pyrolyzing the impregnated product of (g) at 800° C.–1400° C.;

(i) repeating steps (g) and (h) to achieve the desired density.

5,486,251

HIGH FLEXURAL STRENGTH CARBON FIBER REINFORCED SILICON CARBOXIDE COMPOSITE

Roger Y. Leung, Schaumburg, Ill., assignor to AlliedSignal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 464,470, Jan. 12, 1990, and Ser. No. 523,620, May 15, 1990. This application Dec. 19, 1990, Ser. No. 629,923

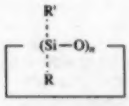
The portion of the term of this patent subsequent to Jun. 7, 2011, has been disclaimed.

Int. Cl.[6] C03B *29/00*

U.S. Cl. 156—89 **2 Claims**

1. A method of preparing fiber reinforced glass composites having a non-brittle failure mode comprising:

(a) polymerizing (1) a cyclosiloxane monomer having the formula



where n is an integer from 3 to 30, R is hydrogen, and R' is an alkene of from 2 to 20 carbon atoms in which one vinyl carbon atom is directly bonded to silicon or (2) two or more different cyclosiloxane monomers having the formula of (1) where for at least one monomer R is hydrogen and R' is an alkyl group having from 1 to 20 carbon atoms and for the other monomers R is an alkene from 2 to 20 carbon atoms in which one vinyl carbon is directly bonded to silicon and R' is an alkyl group of from 1 to 20 carbon atoms, said polymerization taking place in the presence of an effective amount of hydrosilylation catalyst;

(b) applying the polymerization product of (a) to a carbon fiber having a high degree of graphitization to form a prepreg;

(c) laying-up plies of the prepreg of (b) to form a green structure;

(d) curing the green structure of (c) at a temperature not greater than 250° C.;

(e) pyrolyzing the cured structure of (d) at a temperature of about 800° C. to about 1400° C. in non-oxidizing atmosphere;

(f) recovering the pyrolyzed product of (e) as the fiber reinforced glass composite;

(g) impregnating the pyrolyzed product of (f) with the polymerization product of (a);

(h) pyrolyzing the impregnated product of (g) at 600° C.–1400° C.;

(i) repeating steps (g) and (h) until the composite reaches the desired density.

5,486,252

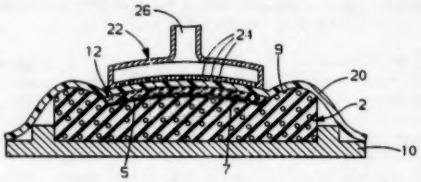
METHOD OF ADHESIVELY BONDING A SEAT COVER TO A SEAT CUSHION

Daniel K. C. Wong, Rochester Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 14, 1994, Ser. No. 209,800

Int. Cl.[6] B32B *31/20*

U.S. Cl. 156—212 **6 Claims**



1. A method of bonding a contoured steam-impermeable seat cover with a first surface to a seat cushion with a second surface comprising:

coating the second surface with a heat-activated adhesive;

placing a flexible planar electric coil heating member between the first and second surfaces;

pressing the first and second surfaces together against the heater with a force of one to five pounds per square inch with a press fixture with an internal cavity with venting holes connected thereto, the press fixture having a contour matching the seat cushion;

heating the adhesive with the heating member to a working to a working temperature of the adhesive;

removing the heating member while the first and second surfaces are still pressed together; and

allowing the adhesive to solidify by blowing forced air passing through the press fixture holes onto the cover and then relieving the pressure between the seat cover and the seat cushion.

5,486,253

METHOD OF LABELING CONTAINERS

Svatoboj Otruba, Ceres, Calif., assignor to B&H Manufacturing Company, Ceres, Calif.

Filed May 17, 1995, Ser. No. 443,317

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—215 **15 Claims**

1. A method of labeling containers comprising:

providing a web of labeling material;

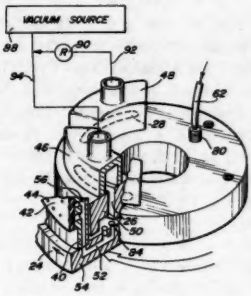
severing the web into label segments;

feeding the label segments to a vacuum drum;

picking up the label segments by the vacuum drum with a first level of vacuum supplied through a first cavity located within the vacuum drum;

holding the label segments on the vacuum drum with a second level of vacuum supplied through a second cavity located within the vacuum drum, said second cavity being separate from the first cavity, and wherein said second level of vacuum is greater than the first level of vacuum;

acting on the label segments while the label segments are being held on the vacuum drum by the second level of vacuum; and



applying the label segments to said containers.

5,486,254

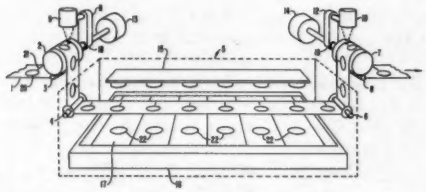
DUAL DRIVE REGISTRATION SYSTEM

John E. Gallagher, and Terence J. Gallagher, both of Brookfield, Conn., assignors to Total Register, Inc., Brookfield, Conn.

Filed Jan. 21, 1993, Ser. No. 6,565

Int. Cl.[6] B32B *31/00;* **B44C** *1/16;* **B65H** *23/18*

U.S. Cl. 156—229 **12 Claims**



1. A method of moving a continuous length of an elastic web in a direction along its length through a work station, said web including a plurality of positions and registration features periodically spaced along the length of the web, and said work station including a plurality of locations which are periodically spaced along a path of the movement of the web in the direction of its length, said method comprising:

choosing a distance between said plurality of positions along the length of the web, when the web is unstretched to be less than a distance between said plurality of workstation locations,

advancing the web at each of two spaced apart places along its length an incremental distance in a direction along its length through said work station past two spaced apart registration feature detectors until a predetermined number of registration features passes each of the detectors, and

prior to advancing the web, positioning said detectors a distance apart along the length of the web to cause the web to be stretched, when advanced within said workstation, an amount along its length that is sufficient to register at least some of said plurality of web positions with said plurality of locations within the work station.

5,486,255

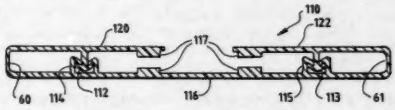
RECLOSEABLE PROFILE STRIP WITH JOINING WEBS

Steven H. Simonsen, Neenah, Wis., assignor to Reynolds Consumer Products Inc., Appleton, Wis.

Division of Ser. No. 166,676, Dec. 14, 1993, Pat. No. 5,358,334, which is a continuation of Ser. No. 16,364, Feb. 11, 1993, abandoned. This application Jul. 15, 1994, Ser. No. 272,991

Int. Cl.[6] A44B *19/16;* **B29C** *47/00*

U.S. Cl. 156—244.15 **1 Claim**



1. A method of making a reclosable profile strip comprising the steps of:

extruding a single strip of molten material that forms a bottom web having a first interlocking member and a second interlocking member and a pair of peel seal strips positioned between said interlocking members, a first top web and a second top web located at opposite ends of the bottom web with each of the top webs having an interlocking member and a peel seal strip positioned adjacent the outer edge thereof, and a first joining web and a second joining web, each joining web being substantially thinner than said top webs and said bottom web, wherein the first joining web joins the first top web to the bottom web and the second joining web joins the second top web to the bottom web;

cooling the strip of molten material;

positioning the first top web and the second top web above the bottom web;

interlocking the interlocking members of the top webs with a corresponding interlocking member of the bottom web; and

heat sealing the peel seal strips of the top webs with a corresponding peel seal strip of the bottom web.

5,486,256

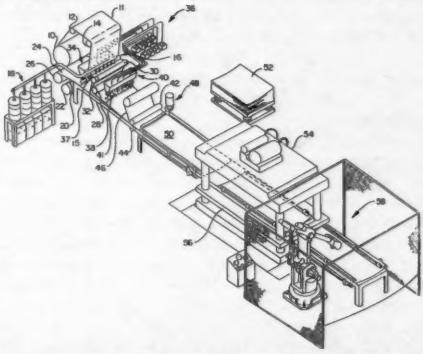
METHOD OF MAKING A HEADLINER AND THE LIKE

Floyd E. Romesberg, Saint Louisville, and David M. Steinke, Baltimore, both of Ohio, assignors to Process Bonding, Inc., Johnstown, Ohio

Filed May 17, 1994, Ser. No. 243,944

Int. Cl.[6] B32B *31/04;31/08;31/18;31/20*

U.S. Cl. 156—251 **12 Claims**



1. A process for making a flexible laminated sheet of foamed resin and fiber glass comprising,

(a) providing layers of open celled polyurethane foam and non-woven scrim, said foam having a thickness in the range of about 0.1 to 1.1 inches, and ILD in the range of 10–80, a density in the range of 0.7–2 pounds per ft^3, and a permeability in the range 2–8 cfm,

(b) providing a layer of material over said scrim layer,

(c) chopping strands of fiber glass to a length in the range 1.5–3 inches and depositing by gravity a first layer of fiber glass over said layer of material, said fiber glass being applied in a density in the range 4–16 gm/ft^2, said layer of material between said first fiber glass layer and said scrim layer confining and supporting said first fiber glass layer.

(d) impregnating said layer of foam with a liquid polyurethane resin, said liquid resin comprising a mixture of about 40–50 volume percent aromatic isocyanate, about 50–60 volume percent polyether polyol, and about 0.0–0.2 volume percent of a catalyst,

(e) running said impregnated foam layer between a first pair of rollers to provide a uniform non-saturating dispersion of said liquid resin in said foam layer,

(f) depositing a second layer of fiber glass over said foam layer, said second fiber glass layer having similar physical characteristics as said first fiber glass layer and being chopped and deposited on said foam layer in the same way as said first fiber glass layer is deposited on said layer of material,

(g) applying said impregnated foam layer and second fiber glass layer over said first fiber glass layer with the foam layer sandwiched between said two fiber glass layers,

(h) compressing all layers together between a pair of calendar rollers to form a laminate with said liquid resin being squeezed from said foam layer into the adjoining fiber glass layers,

(i) applying a cover layer over said second layer of fiber glass, said cover layer being selected from the group consisting of a woven fabric, a permeable vinyl sheet, and an impermeable vinyl sheet,

(j) placing said laminate and cover layer between a pair of molds for a period of about ½–3 min. and at a temperature in the range of about 230°–375° F. to form a preform to a desired shape, and

(k) severing the peripheral edges of said preform to a desired configuration.

5,486,257

METHOD FOR BONDING SUBSTRATES WITH SILICONE RUBBER COMPRISING BOTH A THERMAL AND MOISTURE CROSSLINKING COMPONENT

Masayuki Onishi, Chiba, Japan, assignor to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Filed Apr. 21, 1994, Ser. No. 230,673

Claims priority, application Japan, May 18, 1993, 5-139332

Int. Cl.[6] C09J *5/06;183/04;183/14*

U.S. Cl. 156—305 **1 Claim**

1. A method for bonding substrates with silicone rubber comprising filling a space between two substrates with a silicone rubber composition that comprises a thermal-crosslinking component that is an addition reaction-crosslinking silicone rubber composition comprising a polydiorganosiloxane that has at least 2 alkenyl groups in each molecule, an organosiloxane that has at least 2 silicon-bonded hydrogen in each molecule, and a hydrosilylation catalyst, and a moisture-crosslinking component comprising a combination of trialkoxysiloxy-terminated polydiorganolsiloxane, curing catalyst, and organotrialkoxysilane, where the thermal-crosslinking component and moisture-crosslinking component are present in amounts such that heating the silicone rubber composition results in a silicone gel with a penetration of 10 to 600 according to JIS K 2207, and the silicone moisture cures to a silicone rubber with a hardness of 4 to 80 according to JIS K 6301 using the spring type A test, then heating the silicone rubber composition to give a silicone gel, and finally forming a silicone rubber by moisture-crosslinking the silicone gel.

5,486,258

METHOD FOR BONDING SUBSTRATES WITH SILICONE RUBBER COMPRISING BOTH A THERMAL AND MOISTURE CROSSLINKING COMPONENT

Masayuki Onishi, Ichihara, Japan, assignor to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Division of Ser. No. 230,673, Apr. 21, 1994. This application May 18, 1995, Ser. No. 444,339

Claims priority, application Japan, May 18, 1993, 5-139332

Int. Cl.[6] C09J *5/06;183/04;183/14*

U.S. Cl. 156—307.5 **1 Claim**

1. A method for bonding substrates with silicone rubber comprising coating a substrate with a silicone rubber composition comprising a thermal-crosslinking component that is an addition reaction-crosslinking silicone rubber composition comprising a polydiorganosiloxane that has at least 2 alkenyl groups in each molecule, an organosiloxane that has at least 2 silicon-bonded hydrogen in each molecule, and a hydrosilylation catalyst, and a moisture-crosslinking component comprising a combination of trialkoxysiloxy-terminated polydiorganosiloxane, curing catalyst, and organotrialkoxysilane, where the thermal-crosslinking component and moisture-crosslinking component are present in amounts such that heating the silicone rubber composition results in a silicone gel with a penetration of 10 to 600 according to JIS K 2207, and the silicone gel cures to a moisture cured silicone rubber with a hardness of 4 to 80 according to JIS K 6301 using the spring type A method, then heating the silicone rubber composition to give a silicone gel, then subsequently bringing another substrate into contact with the silicone gel, and finally forming a silicone rubber by moisture-crosslinking the silicone gel.

5,486,259

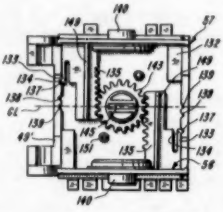
LABELER WITH ADJUSTABLE ROLL MOUNTING MEANS

Brent E. Goodwin, Middletown; Thomas P. Keller, Centerville; James A. Makley, Springboro, and Mark W. Moore, Miamisburg, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 5, 1994, Ser. No. 177,887

Int. Cl.[6] B65C *11/02*

U.S. Cl. 156—384 **20 Claims**

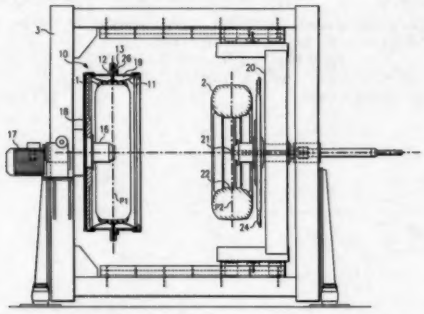


1. Apparatus for printing on a web of record members, the printing apparatus comprising a print head, a platen cooperable with the print head, and means for mounting a roll of a web of record members, wherein the mounting means includes a pair of roll mounting members, means for moving the mounting members in unison toward or away from each other to different selected positions to mount rolls of different predetermined widths, and means for releasably holding the mounting members in the selected position.

5,486,260
DEVICE FOR ASSEMBLY OF A TIRE CASING AND AN ANNULAR TREAD MEMBER EXTENDED BY CENTRIFUGATION

Michel Garmy, Le Cendre, France, and Bernard Ravel, Nohanent, both of, France, assignors to Compagnie Generale Des Etablissements Michelin - Michelin et Cie, Clermont-Ferrand

Filed Jun. 21, 1994, Ser. No. 263,301
Claims priority, application France, Jun. 25, 1993, 93 07883
Int. Cl.[6] B29D *30/56*
U.S. Cl. 156—406.2 **18 Claims**



1. Device for assembling tire casing and a prevulcanized annular tread member, comprising:

a frame;

first means of support of said annular tread member;

second means of support of said tire casing;

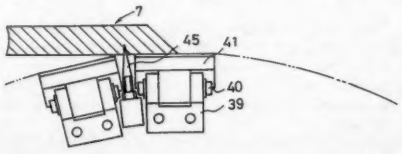
means for relative displacement of said first and second means of support to make the circumferential planes of reference of said annular tread member and of said tire casing substantially coincide; and

said first and second means of support being mounted rotatably to the frame and having means for putting, at least, said first means of support into rotation to cause centrifugal expansion of said annular tread member, wherein, sold first means of support of said annular tread member have means for engaging the radially exterior surface of said annular tread member initially before rotation of said annular tread member and thereafter continuing to engage said annular tread member during rotation thereof.

5,486,261
METHOD OF AND APPARATUS FOR AUTOMATICALLY ASSEMBLING BEAD APEX

Nobuyuki Kikuchi; Katsuaki Ookochi, both of Shirakawa; Masatsugu Onuki, Fukushima, and Kazuaki Yarimizu, Shirakawa, all of, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Division of Ser. No. 120,333, Sep. 14, 1993, Pat. No. 5,403,418. This application Oct. 14, 1994, Ser. No. 321,858
Claims priority, application Japan, Sep. 29, 1992, 4-260121
Int. Cl.[6] B29D *30/50*
U.S. Cl. 156—422 **12 Claims**



1. An apparatus for automatically assembling a bead apex comprising:

a means for joining a pair of longitudinal ends of a strip apex, said strip apex having substantially a triangular section with a short side and first and second long sides and a specified length, to each other, and for forming said strip apex in a cylindrical body such that said first and second long sides become inner and outer peripheral surfaces;

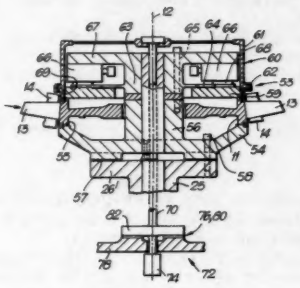
a means for forming said cylindrical body into a disk shape such that said short side becomes an inner peripheral surface thereof and said first and second long sides become first and second axial end surfaces, respectively, said cylindrical body formation means including needles which project radially outwardly of a cylindrical outer peripheral surface thereof for sticking said apex; and

a means for joining the inner peripheral surface of said disk shape apex to an outer peripheral surface of a bead ring.

5,486,262
FRICTION WELDING

John G. Searle, Cannock, England, assignor to Rolls-Royce plc, London, England

Filed May 13, 1994, Ser. No. 242,458
Claims priority, application United Kingdom, May 13, 1993, 9309819
Int. Cl.[6] B23K *20/12*
U.S. Cl. 156—580 **11 Claims**



1. A workpiece tooling assembly for holding a first component during friction welding, the first component having first and second opposite end faces spaced apart from each other and a peripheral surface to which at least one further component is to be friction welded, the workpiece tooling assembly being driven in an angularly reciprocating movement and comprising:

a driven workpiece mounting member;

an axially extending structure mounted to and operatively connected with the driven workpiece mounting member; and

a workpiece clamping assembly mounted to the axially extending structure, the workpiece clamping assembly having:

a first clamp member disposed concentrically with and operatively connected to the axially extending structure to engage the first end face of the first component around a first annular region,

a second clamp member disposed concentrically with and operatively connected to the axially extending structure to engage the second end face of the first component around a second annular region opposite the first annular region, the first and second clamp members being arranged to leave exposed the peripheral surface, and

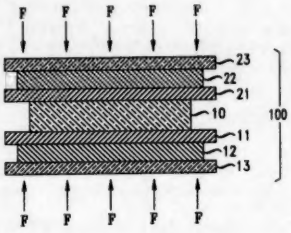
clamp force generating means operative to urge the first and second clamp members towards each other in an axial direction to engage and to exert a frictional clamping force of sufficient magnitude on the first component to resist welding and frictional heating forces applied perpendicular to the peripheral surface, wherein the axially extending structure transmits clamping loads from the first and second clamp members to the driven workpiece mounting member.

5,486,263

ETCHING A DIAMOND BODY WITH A MOLTEN OR PARTIALLY MOLTEN METAL

William C. Dautremont-Smith, Westfield, N.J.; John E. Graebner, New York, N.Y.; Sungho Jin, Millington, and Avishay Katz, Westfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 2, 1992, Ser. No. 908,130
Int. Cl.[6] H01L *21/00*
U.S. Cl. 216—33 **18 Claims**



1. A method of removing a thickness of material from a diamond body having at least one face, including the steps of

(a) maintaining at least a portion of the face in direct physical contact with a molten or partially molten material comprising a rare earth metal or a rare earth metal mixture that dissolves carbon; and

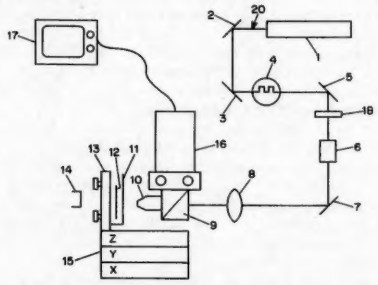
(b) maintaining the molten or partially molten material, within a temperature range between about 700° C. and about 1300° C., whereby a thickness of the body located at the portion of the face thereof is removed.

5,486,264

LASER ETCHING OF SEMICONDUCTORS

Osman A. Ghandour, New York, N.Y., assignor to The Trustees of Columbia University, New York, N.Y.

Continuation-in-part of Ser. No. 857,449, Mar. 25, 1992, abandoned. This application Apr. 22, 1994, Ser. No. 231,886
Int. Cl.[6] H01L *21/306*
U.S. Cl. 156—635.1 **7 Claims**



1. A process for etching a region of a semiconductor substrate immersed in an etchant solution and illuminated with light of an appropriate wavelength, comprising the steps of:

placing the substrate in the etchant solution in a selected orientation; and

applying an intermittent focused light beam having a selected direction on said region until a desired level of etching has occurred;

wherein the orientation of the substrate and the direction of the light beam are selected such that bubbles formed during etching escape from the substrate during intermission of the light beam, and such that the bubbles escape without blocking the light beam, and

wherein the light beam has a beam waist with a diameter, and wherein the beam waist is in front of the substrate by a distance which equals 2½ times the diameter of the beam waist,

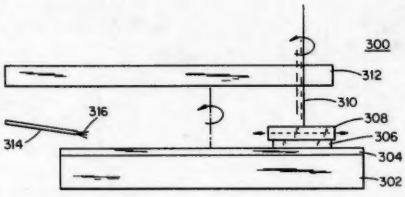
whereby a via hole is etched in the substrate, having a constant diameter over a major portion of hole depth.

5,486,265

CHEMICAL-MECHANICAL POLISHING OF THIN MATERIALS USING A PULSE POLISHING TECHNIQUE

Isidore Salugsugan, Fremont, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 6, 1995, Ser. No. 383,737
Int. Cl.[6] H01L *21/304*
U.S. Cl. 156—636.1 **16 Claims**



1. A method of manufacturing a semiconductor device wherein a surface on a wafer is planarized, comprising:

placing the wafer to be planarized on a polishing pad;

applying a polishing slurry to the polishing pad;

chemical-mechanical polishing the surface to effect planarization while applying a first pressure to the wafer; and

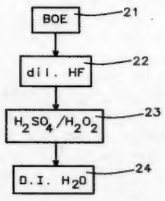
intermittently reducing the first pressure to a second pressure a plurality of times during chemical-mechanical polishing to reduce starvation.

5,486,266

METHOD FOR IMPROVING THE ADHESION OF A DEPOSITED METAL LAYER

Chia S. Tsai, and Tien C. Chang, both of Hsin Chu, Taiwan, Prov. of China, assignors to Taiwan Semiconductor Manuf. Company, Hsinchu, Taiwan, Prov. of China

Filed Sep. 1, 1994, Ser. No. 299,267
Int. Cl.[6] H01L *21/00*
U.S. Cl. 156—657.1 **26 Claims**



1. A method for cleaning the surface of a partially manufactured integrated circuit, just prior to the deposition of a metallic layer onto said surface, comprising:

dipping said surface in a buffered oxide etch composed of 1 part by volume of hydrofluoric acid, 1 part of ammonium fluoride, and water;

immersing said surface in a solution of hydrofluoric acid in water;

then immersing said surface in a mixture containing sulphuric acid, hydrogen peroxide, and water; and

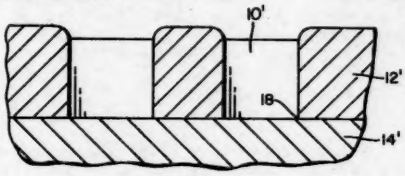
rinsing said surface in deionized water and then drying it.

5,486,267

METHOD FOR APPLYING PHOTORESIST

Stephen E. Knight, Essex Junction; Stephen E. Luce, Cambridge, and Thomas L. McDevitt, Underhill, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1994, Ser. No. 202,418
Int. Cl.[6] H01L *21/00*
U.S. Cl. 156—659.11 11 Claims



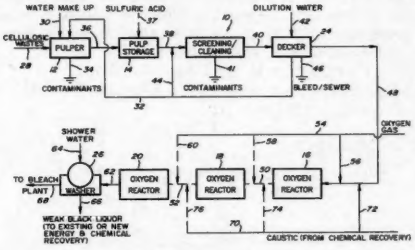
1. A method for substrate preparation comprising:
providing a substrate comprising a film selected from the group of silicon dioxide and silicon nitride;
treating said substrate with ozone; then
applying a resist to said treated substrate and patterning said resist over said treated substrate.

5,486,268

OXYGEN DELIGNIFICATION OF OLD CORRUGATED CONTAINERS

Xuan T. Nguyen, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Division of Ser. No. 170,154, Dec. 20, 1993, Pat. No. 5,350,493, which is a division of Ser. No. 837,870, Feb. 18, 1992, Pat. No. 5,302,244. This application Jun. 16, 1994, Ser. No. 260,876
Int. Cl.[6] D21C *5/02*
U.S. Cl. 162—13 8 Claims



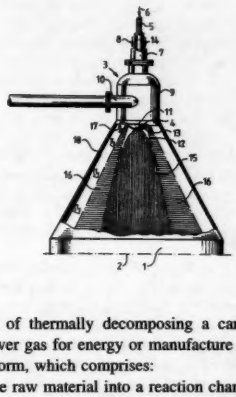
1. A process for producing a wood-free white paper product comprising:
a) bleaching a cellulosic fiber pulp having an ISO brightness of at least 30 and a fiber strength of at least 11 km, derived by oxygen delignification of old corrugated containers having a kappa number of at least 70 and consisting essentially of recycled fibers of the old corrugated containers and having a viscosity of at least 10 cp and a kappa number of 15 to 35 to provide a bleached pulp having a viscosity of at least 10 cp suitable as the sole pulp component in white paper product manufacture,
b) forming the bleached pulp into a white paper product on a paper machine in a paper making operation, and
c) taking the formed white paper product from the paper machine,
wherein said cellulosic fiber pulp is produced in a process consisting essentially of:
i) reslushing said old corrugated containers with water,
ii) subjecting the reslushed old corrugated containers from i) to a pretreatment with an aqueous mineral acid,
iii) subjecting the thus pretreated, reslushed, old pretreated corrugated containers from ii) to said oxygen delignification in the presence of alkaline material at a temperature of 80° C. to 120° C., and an oxygen pressure of 60 to 120 psig for a time effective to lower the kappa number to 15 to 35, said oxygen delignification consisting essentially of exposing said pretreated old corrugated containers in an aqueous vehicle, to oxygen gas in the presence of said alkaline material, in a plurality of sequential oxygen delignification stages, in which the pretreated old corrugated containers are exposed to said alkaline material in sequentially introduced dosages of the alkaline material, such that in each of said sequential oxygen delignification stages, the dosage is less than the required total dosage based on the weight of lignin in the old corrugated containers, said pretreated, reslushed, old corrugated containers and aqueous vehicle flowing sequentially through said stages and having a residence time in each stage to permit delignification.

5,486,269

GASIFICATION OF CARBONACEOUS MATERIAL IN A REACTOR HAVING A GASIFICATION ZONE AND A COMBUSTION ZONE

Bengt Nilsson, Skoghall, Sweden, assignor to Chemrec Aktiebolag, Karlstad, Sweden

Filed Apr. 28, 1994, Ser. No. 232,069
Claims priority, application Sweden, Nov. 4, 1991, 9103217
Int. Cl.[6] D21C *11/12*
U.S. Cl. 162—31 16 Claims



1. A method of thermally decomposing a carbonaceous raw material to recover gas for energy or manufacture of chemicals in solid or liquid form, which comprises:
(a) feeding the raw material into a reaction chambers,
(b) gasifying the raw material under controlled understoichiometric conditions, wherein the gasification is carried out in an inner gasification zone at a pressure from atmospheric pressure up to about 150 bar and at a temperature within the range 500°–1600° C.,
(c) combusting a fuel which is supplied to the reaction chamber at a point located at a distance from the point of feeding the raw material to provide at least a part of the thermal energy required to maintain the endothermic reactions in the gasification zone wherein the combustion of the fuel is carried out in a combustion zone in gaseous contact with the inner gasification zone to surround the inner gasification zone
(d) maintaining a zone of oxygen-containing gas close to and outside of the combustion zone by supplying oxygen-containing gas to the reaction chamber at one point located at a distance from the point for supplying of the fuel and in an amount sufficient to oxidize at least substantially all the fuel supplied to the combustion zone.

5,486,270
ANGULARLY ADJUSTABLE DRAINAGE FOIL FOR PAPER MACHINES

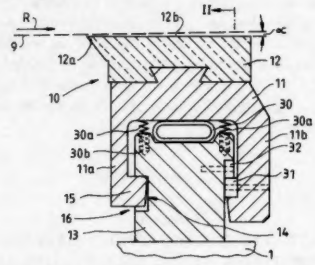
Christian Schiel, Heidenheim, Germany, assignor to J.M. Voith GmbH, Heidenheim, Germany

Filed Mar. 3, 1994, Ser. No. 205,575

Claims priority, application Germany, Mar. 3, 1993, 43 06 503.1

Int. Cl.[6] D21F *1/54*

U.S. Cl. 162—352 **9 Claims**



1. An angularly adjustable drainage foil for a revolving dewatering wire of a paper machine, comprising:

a facultatively two-part support structure extending across the width of the machine, said two-part support structure comprising a first beam and a backing shape mounted on said beam, said support structure having a top side, an approach-side backing surface and a departure-side backing surface;

a facultatively two-part cover strip extending across the width of the machine, said two-part cover strip having an underside and having claw-like members, one of said claw-like members being configured and arranged for engaging said approach-side backing surface and another of said claw-like members being configured and arranged for engaging said departure-side backing surface, said cover strip further comprising an upper, wear-resistant foil strip and a support shape supporting said foil strip, said foil strip having a drainage surface;

a moving device for effecting a relative longitudinal motion between said cover strip and said support structure;

means for influencing an angle of incidence α between said drainage surface and a surface of said wire running over said drainage surface, upon relative movement between said cover strip and support structure; and

compression means between said underside of the cover strip and said top side of the support structure for forcing said claw-like members and said backing surfaces into said engagement;

said cover strip being configured such that it grips the backing shape in claw-like fashion, and wherein the approach-side claw-like engagement of the support structure by the cover strip comprises a joint parallel with the longitudinal axis; and the departure-side claw-like engagement of the support structure by the cover strip on the side of the cover strip and on the side of the support structure includes a plurality of paired, inclines.

5,486,271
PROCESS FOR PREPARING PERFLUOROALKANESULFONYL FLUORIDES

John C. Hansen, Lakeland, and Herward A. Vogel, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 11, 1994, Ser. No. 320,527

Int. Cl.[6] C25B *3/00;3/08*

U.S. Cl. 204—59 F **20 Claims**

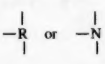
1. A process of preparing perfluoroalkanesulfonyl fluorides comprising electrochemically fluorinating in the presence of anhydrous hydrogen fluoride a compound of the formula $(RSO_2)_nX$ wherein R is alkyl of 1 to 20 carbon atoms in which the carbon chain may be interrupted by one or more ether oxygen atoms;

(a) n is 1, and X is $—R^i$, $—OR^i$, $—NR^{ii}R^{iii}$ or $—SO_2R$, in which R is as defined above; R^i is R; R^{ii} and R^{iii} are each independently hydrogen or alkyl of 1 to 8 carbon atoms in which the carbon chain may be interrupted by one or more ether oxygen atoms, or when taken together with the nitrogen atom form a five to seven membered heterocyclic ring optionally interrupted by a heteroatom selected from nitrogen, oxygen and sulfur; with the proviso of excluding dimethylsulfone and diethylsulfone;

(b) n is 2, and X is $—R^i—$, $—OR^i—$, $—OR^{iv}O—$ or

in which R^i is an alkylene of 1 to 20 carbon atoms optionally containing one or more ether oxygen atoms; R^{iv} is alkylene of 1 to 8 carbon atoms; R^{ii} is hydrogen or alkyl of 1 to 8 carbon atoms in which the carbon chain may be interrupted by one or more ether oxygen atoms, or

(c) n is 3, and X is



in which R is as defined above but with 3 bond sites, with the proviso that the electrochemical fluorination is conducted under the following conditions: current density of about 10 to 600 amps per square meter of anode surface; and a temperature sufficient to maintain a boiling hydrogen fluoride liquid phase during the fluorination.

5,486,272
ELECTROPLATING METHOD AND APPARATUS

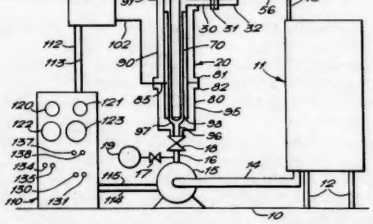
John D. C. Hemsley, Old Woking; Albert W. Gale, Yateley, and Adrian Schwalb, Crowthorne, all of, Great Britain, assignors to Enthone-Omi Inc., West Haven, Conn.

Filed May 31, 1994, Ser. No. 251,152

Claims priority, application United Kingdom, May 28, 1993, 9311055; Aug. 5, 1993, 9316215

Int. Cl.[6] C25C *1/00*

U.S. Cl. 204—105 R **13 Claims**



1. A method of removing metal from a feedstock solution containing dissolved metal ions which comprises passing the feedstock through an annular gap formed by an inner cathode tube and an outer anode tube at a flow rate which is turbulent and which, in conjunction with the cross section of the gap, provides Re value (as defined herein) of the flow of at least 2100, the inner surface of the gap being cathodic to the metal ions in the solution and formed of a metal which is smooth and is not attacked by the solution, the outer surface of the gap being smooth and anodic to the metal ions in the solution, inducting the solution flow into the annular gap by means of a pump coupled directly to the gap, the end of the inner

cathode tube being closed by a non-conductive domed plug which faces the incoming flow of solution and distributes it evenly to the annular gap and depositing the metal ions in the feedstock solution on the cathodic surface.

5,486,273

RESILIENT MATERIAL AND DISPOSABLE, ABSORBENT ARTICLE COMPRISING SUCH A MATERIAL

Urban Widlund, Mölnlycke, and Roy Hansson, Mölndal, both of, Sweden, assignors to Mölnlycke AB, Göteborg, Sweden

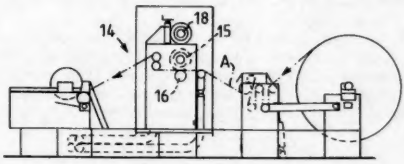
PCT No. PCT/SE90/00475, § 371 Date Dec. 27, 1991, § 102(e) Date Dec. 27, 1991, PCT Pub. No. WO91/00720, PCT Pub. Date Jan. 24, 1991

PCT Filed Jul. 3, 1990, Ser. No. 781,141

Claims priority, application Sweden, Jul. 6, 1989, 8902457

Int. Cl.[6] B28B *1/48*

U.S. Cl. 264—154 **9 Claims**



1. A method of imparting varying degrees of resilience to different areas of an elastic material for absorbent, disposable articles, comprising providing an elastic material, removing material from areas of the elastic material which are to be given a lesser degree of resilience than remaining areas of said elastic material while also leaving attached material-parts in the areas of said elastic material from which material has been removed in order to give different areas of the elastic material different properties upon being stretched.

5,486,274

POLY-SUBSTITUTED PHTHALOCYANINES

Dean Thetford, Manchester, and Peter Gregory, Bolton, both of, England, assignors to Zeneca, Limited, London, United Kingdom

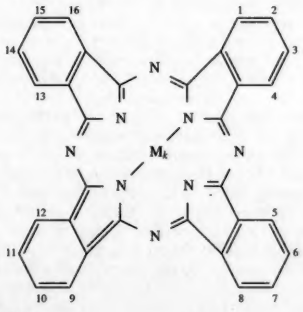
Continuation of Ser. No. 777,719, Oct. 21, 1991, abandoned. This application Nov. 17, 1994, Ser. No. 344,682

Claims priority, application United Kingdom, Nov. 2, 1990, 9023894; Nov. 21, 1990, 9025280

Int. Cl.[6] C07D *487/22*

U.S. Cl. 204—157.5 **9 Claims**

1. A process for the generation of singlet oxygen comprising irradiating, in the presence of oxygen, a phthalocyanine having formula (1):



Formula (1)

wherein

M is selected from H, metal, halometal, oxymetal and hydroxymetal; and

k is the inverse of ½ of the valency of M; and wherein at least one of the peripheral carbon atoms in the 1–16 positions of the phthalocyanine nucleus (M_kPc) of formula (1) is linked via an oxygen atom to an organic radical selected from the group consisting of phenyl, naphthyl, pyridyl, thiophenyl, furanyl, quinolinyl, thiazolyl, benzothiazolyl, pyrimidyl, C_{1-10}-alkyl, C_{3-10}-alkenyl and cyclohexyl which is unsubstituted or is substituted by a group selected from the group consisting of C_{1-20}-alkyl, C_{1-20}-alkoxy, C_{2-20}-alkenyl, C_{1-20}alkylthiol, C_{1-20}-alkoxycarbonyl, hydroxyC_{1-4}-alkoxy, phenyl, benzyl, phenylthio, fluoro, chloro, bromo, —CN, —NO_2, —CF_3, —COR^2, —$COOR^2$, —$CONR^2R^3$, —SO_2R^2, —$SO_2NR^2R^3$, —NR^2R^3 and —OR^2 in which R^2 and R^3 are each independently —H, C_{1-4}-alkyl or phenyl and —SO_3A in which A is —H, a metal or an ammonium ion and the remaining peripheral carbon atoms are unsubstituted or substituted by a member selected from the group consisting of hydrogen, halogen and —SO_3A wherein A is H, a metal or an ammonium ion.

5,486,275

NITROGEN-CONTAINING PERFLUOROALKYL BROMIDE AND METHOD FOR PRODUCTION THEREOF

Haruhiko Fukaya, Oobu; Takashi Abe, Kasugai; Eiji Hayashi, Konan; Yoshio Hayakawa, Aichi, and Hajime Baba, Nagoya, all of, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Division of Ser. No. 22,463, Feb. 25, 1993, abandoned. This application Aug. 24, 1994, Ser. No. 293,963

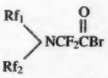
Claims priority, application Japan, Feb. 28, 1992, 4-78887

Int. Cl.[6] C07C *2/00*

U.S. Cl. 204—157.6 **12 Claims**

1. A method for producing a nitrogen-containing perfluoroalkyl bromide, comprising the step of:

decarbonylating, by exposure to ultraviolet light, a nitrogen-containing perfluorocarboxylic acid bromide represented by the formula:



(II)

wherein Rf_1 and Rf_2 independently stand for a perfluoroalkyl group of one to five carbon atoms, provided that

1) Rf_1 and Rf_2 are separated from each other,

2) Ff_1 and Rf_2 are directly bonded to each other,

3) Rf_1 and Rf_2 are bonded to each other through the medium of an oxygen atom to form a heterocycle, or

4) Rf_1 and Rf_2 are bonded to each other through the medium of a nitrogen atom to form a heterocycle.

5,486,276

METHOD FOR MANUFACTURING SMALL MAGNETIC DISKS FROM A LARGE DISK

Yoshito Kitamoto; Masahiro Takagi; Hiroshi Akiba, and Kazuyuki Seki, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 10, 1993, Ser. No. 120,149

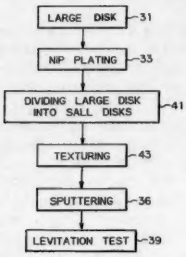
Claims priority, application Japan, Sep. 10, 1992, 4-241790; Sep. 29, 1992, 4-259513

Int. Cl.[6] C23C *14/34;* **B05D** *3/12*

U.S. Cl. 204—192.2 **15 Claims**

1. A method for manufacturing small magnetic disks having an outer diameter, said method comprising the steps of:

preparing a nonmagnetic large disk having an outer diameter and an inner diameter, one half of the difference between the outer



and inner diameters of said large disk being greater than said outer diameter of said small disks to be manufactured;

subjecting said large disk to at least one step of a manufacturing process necessary for manufacturing a magnetic disk from a nonmagnetic substrate; and

dividing said large disk into a plurality of said small disks.

5,486,277

HIGH PERFORMANCE CAPACITORS USING NANO-STRUCTURE MULTILAYER MATERIALS FABRICTION

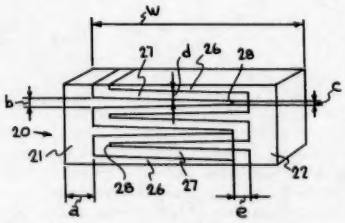
Troy W. Barbee, Jr., Palo Alto; Gary W. Johnson, and Dennis W. O'Brien, both of Livermore, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Division of Ser. No. 122,940, Sep. 20, 1993, Pat. No. 5,414,588.

This application Feb. 6, 1995, Ser. No. 384,096

Int. Cl.[6] C23C *14/00;14/32*

U.S. Cl. 204—192.15 **19 Claims**



1. A method for fabricating nano-structure multilayer capacitors, comprising:

depositing at least one layer of conductive material by magnetron sputtering in an inert atmosphere;

masking selected areas of the thus deposited layer of conductive material;

depositing a layer of dielectric material on at least the unmasked areas of the conductive material;

removing the maskant;

depositing by magnetron sputtering at least another layer of conductive material on at least the dielectric material;

masking selected areas of the thus deposited layer of conductive material;

depositing a layer of dielectric material on at least unmasked areas of the conductive material; and

removing the maskant.

5,486,278

TREATING PREBAKED CARBON COMPONENTS FOR ALUMINUM PRODUCTION, THE TREATED COMPONENTS THEREOF, AND THE COMPONENTS USE IN AN ELECTROLYTIC CELL

Fausto Manganiello, Portoscuso, Italy; Jean-Jacques Duruz, Geneva, Switzerland, and Vittorio Bello, Portoscuso, Italy, assignors to Moltech Invent S.A., Luxembourg

Filed Mar. 28, 1994, Ser. No. 218,679

Claims priority, application European Pat. Off., Jun. 2, 1993, 93810401; Aug. 2, 1993, 93810545

Int. Cl.[6] C25C *7/00;3/08*

U.S. Cl. 204—243 R **28 Claims**

1. A method of treating a carbonaceous cell component of an electrolytic cell for the production of aluminium, to improve the resistance of said component to deterioration during operation of the cell by attack of air and anodically-releasing oxidizing gases, by treating a surface of said carbonaceous cell component with a boron-containing solution, wherein said solution is at temperatures up to 120° C., wherein the method comprises intaking the boron-containing solution to a selected depth of 1–10 cm into the component to be protected.

18. An electrolytic cell for the production of aluminium by the electrolysis of alumina in a molten fluoride electrolyte, comprising a component treated by the method of claim **1**, the component being installed with its treated surface in contact with air and oxidizing gases released during operation of the cell.

5,486,279

ELECTROCHEMICAL MEASURING PROBE

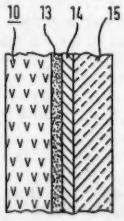
Karl-Hermann Friese, Leonberg; Helmut Weyl, Schwieberdingen, and Hans-Martin Wiedenmann, Stuttgart, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 842,378, Mar. 26, 1992. This application Apr. 14, 1994, Ser. No. 227,568

Claims priority, application Germany, Jan. 17, 1989, 39 34 586.6

Int. Cl.[6] G01N *27/407*

U.S. Cl. 204—429 **8 Claims**



1. Electrochemical measuring probe for determining the oxygen content of gases comprising: a solid-electrolyte body having at least one cermet electrode on the side of the solid-electrolyte body exposed to the gas to be measured with said at least one electrode having a supporting matrix composed of a finely divided ion-conducting ceramic material, a porous ceramic protective layer on the cermet electrode exposed to the gas to be measured, and a finely porous ion-conducting covering layer disposed between and directly adherent to the cermet electrode and the porous ceramic protective layer; and wherein the finely porous ion-conducting covering layer is comprised predominately of the same ion-conducting supporting matrix material as that of the cermet electrode exposed to the gas to be measured, with the porosity of said covering layer being substantially the same as that of said cermet electrode, with said covering layer being at least ½, and not greater than 3 times, as thick as said at least one cermet electrode, and with the pore diameters in said covering layer being not larger than the layer thickness of said covering layer.

5,486,280

PROCESS FOR APPLYING CONTROL VARIABLES HAVING FRACTAL STRUCTURES

Jonathan S. Bullock, IV, Oak Ridge, and Roger L. Lawson, Oliver Springs, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Oct. 20, 1994, Ser. No. 326,425
Int. Cl.[6] C25D *1/00*
U.S. Cl. 205—67 17 Claims

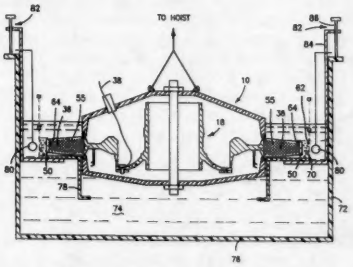
10. A process for electroforming, comprising the steps of:
applying a pulsed-current waveform across a substrate and an electrode located in an electrolyte to cause the deposition of a material on a surface of the substrate;
the pulsed-current waveform having a fractal waveform selected to achieve a desired characteristic of the material deposited on the surface of the substrate,
wherein the fractal waveform comprises a first pulsed-current waveform and a second pulsed-current waveform.

5,486,281

METHOD FOR CBN TIPPING OF HPC INTEGRALLY BLADED ROTORS

Gary A. Gruver, South Windsor; Joseph J. Parkos, Jr., East Haddam, and Robert G. Adinolfi, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 15, 1993, Ser. No. 138,530
Int. Cl.[6] C25D *5/02*
U.S. Cl. 205—110 9 Claims



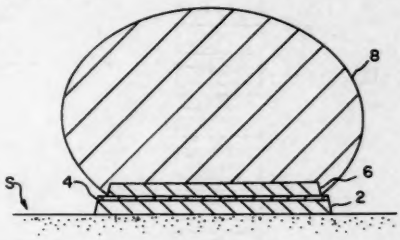
1. A method for forming abrasive surfaces on the tips of a plurality of airfoils integrally joined to a disc structure, said method comprising the steps of:
providing a mechanical masking device having a plurality of openings arranged around the circumference thereof;
installing said airfoils and disk structure within said mechanical masking device so that said disk structure is protected by said masking device and portions of said airfoils including tip portions thereof extend through said openings;
forming a coating containing abrasive particles on said tip portions of said airfoils;
said forming step comprising immersing said mechanical masking device with said installed airfoils in a plating solution containing a matrix material and an abrasive grit material, said airfoils lying in a substantially horizontal plane and said tip portions each being oriented in a substantially vertical plane during the coating forming step; and
said forming step further comprising applying an electrical current through said plating solution so as to cause said matrix material and said grit material to be deposited onto said tip portions.

5,486,282

ELECTROETCHING PROCESS FOR SEED LAYER REMOVAL IN ELECTROCHEMICAL FABRICATION OF WAFERS

Madhav Datta, Yorktown Heights, and Ravindra Shenoy, Peekskill, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 30, 1994, Ser. No. 346,996
Int. Cl.[6] C25D *5/10*; C25F *3/02*
U.S. Cl. 205—123 5 Claims



1. A method of preparing wafers comprising:
depositing a metallic seed first layer composed of a first metal onto a substrate surface;
depositing a metallic seed second layer composed of a second metal onto the first layer;
depositing a metallic seed third layer composed of a third metal onto the second layer;
selectively masking areas of the surface of said third layer with masking material;
depositing a plurality of solder bumps formed on the third layer distal the first layer, each one of the plurality of bumps masking a respective one of a plurality of discrete non-contiguous regions over the substrate surface;
removing said masking material; and
electroetching in an electrolyte the third seed layer and the second seed layer sufficiently to remove the third metal and the second metal from the wafer over the areas between the solder bumps;
and removing said first layer between said solder bumps.

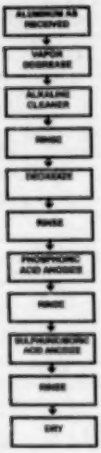
5,486,283

METHOD FOR ANODIZING ALUMINUM AND PRODUCT PRODUCED

Jason G. Mnich, Riverside, Calif., assignor to Rohr, Inc., Chula Vista, Calif.

Filed Aug. 2, 1993, Ser. No. 100,891
Int. Cl.[6] C25B *1/00*
U.S. Cl. 205—174 23 Claims

1. A chromium free method of anodizing an unroughened aluminum alloy workpiece to produce an oxide surface receptive to the formation of strong and durable bonds with epoxy adhesives and coatings and resistant to corrosion comprising the steps of:
providing a first aqueous anodizing solution consisting essentially by weight of about 10–20% phosphoric acid;
maintaining said first anodizing solution at a temperature from about 75° to 90° F.;
immersing said workpiece in said first anodizing solution;
applying a direct electric current having a voltage of about 5 to 15 volts across the workpiece in said solution, such that the current density is substantially uniform across the workpiece and does not exceed about 10 amperes per square foot, for a period of time sufficient to produce a thin, porous, highly adherent oxide at least 5000 angstroms thick on the surface of said workpiece;
providing a second aqueous anodizing solution consisting essentially by weight of 3–5% sulfuric acid and 0.5–1.5% boric acid;
maintaining said second anodizing solution at a temperature from about 75° to 85° F.;



removing the workpiece from the first anodizing solution and immersing it in the second anodizing solution;

applying a direct electric current having a voltage of about 15 volts across the workpiece in said solution, such that the current density is substantially uniform across the workpiece and does not exceed about 10 amperes per square foot, for a period of time sufficient to produce a further growth of a less porous oxide on the workpiece with the final oxide coating having a weight of around about 250 to 650 milligrams per square foot and a thickness of about 15,000 to 31,000 angstroms, which final oxide coating does not substantially reduce the fatigue resistance of the workpiece.

5,486,284

CATALYTIC CRACKING WITH MCM-49

Thomas F. Degnan, Moorestown, N.J.; Terry E. Helton, and Daria N. Lissy, both of Glen Mills, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 15, 1994, Ser. No. 297,468

Int. Cl.[6] C10G *11/05*

U.S. Cl. 208—120 **17 Claims**

10. A process for catalytically cracking a hydrocarbon feed boiling above 650° F. comprising:

a. charging said hydrocarbon feed to a riser catalytic cracking reactor;

b. charging a hot fluidized solids mixture from a catalyst regenerator to the base of said riser reactor, said mixture comprising a physical mixture of:

95 to 50 wt % base FCC catalyst containing at least one of zeolite Y, zeolite beta or both in a matrix, and

5 to 50 wt. % MCM-49 additive catalyst containing a catalytically effective amount of MCM-49 in an amorphous support;

c. catalytically cracking said feed at catalytic cracking conditions including a riser outlet temperature of about 925° to 1100° F. to produce catalytically cracked products including C3 and C4 olefins and a catalytically cracked naphtha fraction having an octane number and a spent solids mixture comprising base FCC catalyst and MCM-49 additive catalyst which are discharged from said outlet of said riser reactor;

d. separating in a vessel containing said riser outlet a cracked product rich vapor phase, which is withdrawn from said vessel, from a spent solids mixture rich phase containing base FCC catalyst and MCM-49 additive catalyst;

e. stripping said spent solids mixture in a stripping means at stripping conditions to produce a stripped solids phase;

f. decoking said stripped solids phase in a catalyst regeneration means operating at catalyst regeneration conditions to produce said hot fluidized solids mixture, which is recycled to the base of said riser reactor, and

g. fractionating said cracked product rich vapor phase in a product fractionation means to produce an overhead vapor fraction, a liquid fraction containing at least one of C3 and C4 olefins and a catalytically cracked naphtha fraction.

5,486,285

AIR INLET VALVE FOR WATER COOLER

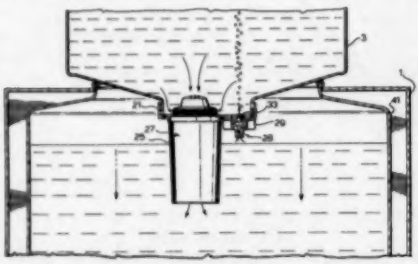
Brian Feeney, Toronto, Canada, assignor to The Clorox Company, Oakland, Calif.

Filed Jun. 10, 1994, Ser. No. 258,459

Claims priority, application Canada, Jun. 10, 1993, 2098127

Int. Cl.[6] B01D *35/143;35/027*

U.S. Cl. 210—85 **6 Claims**



5. For use in a water cooler having a reservoir adapted to receive a neck portion of an inverted water tank, a filter system comprising attachment means for removable connection to said neck portion and forming a water-tight seal therewith, sleeve means projecting from said attachment means for receiving a replaceable water filter adapted to pass water from said neck portion of said tank into said reservoir, and a one-way valve projecting from said attachment means for admitting air into said neck portion of said tank responsive to water flowing out of said neck portion of said tank via said water filter, said one-way valve including movable bead means adapted to prevent water from flowing therethrough while permitting air to pass therethrough, further comprising a rotatable indicator mounted to said one-way valve for monitoring replacement intervals of said replaceable water filter.

5,486,286

APPARATUS FOR PERFORMING A SELF-TEST OF KIDNEY DIALYSIS MEMBRANE

Bruce A. Peterson, Milwaukie; Mark E. Connell, Sandy; Robert A. Bedient, Portland, all of Oreg.; Raymond Elsen, Antwerp, Belgium; Michael E. Hogard, Oregon City, Oreg.; Harley D. Johnson, Portland, Oreg.; Thomas D. Kelly, Portland, Oreg.; Jean M. Long, Portland, Oreg.; William G. Preston, Jr., Portland, Oreg., and Dalibor J. Smejtek, Beaverton, Oreg., assignors to Althin Medical, Inc., Miami Lakes, Fla.

Division of Ser. No. 688,174, Apr. 19, 1991, Pat. No. 5,247,434.

This application Sep. 14, 1993, Ser. No. 122,047

Int. Cl.[6] B01D *61/34*

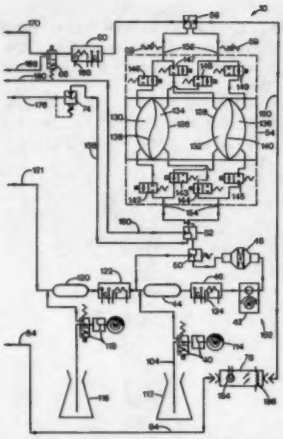
U.S. Cl. 210—87 **16 Claims**

1. A kidney dialysis machine comprising:

(a) a dialyzer having a dialysate compartment, a blood compartment separated from the dialysate compartment by a dialysis membrane, a dialysate input, a dialysate output, a blood input, and a blood output;

(b) means for preparing dialysate and means for circulating the dialysate through a dialysate circuit, the dialysate circuit including the dialysate compartment, the dialysate input and the dialysate output of the dialyzer;

(c) means for effecting extracorporeal circulation of blood from a dialysis patient through a blood circuit, the blood circuit



including the blood compartment, the blood input, and the blood output of the dialyzer;

(d) means for delivering a first volume of dialysate to the dialysate compartment of the dialyzer;

(e) means for removing, simultaneously with delivering the first volume, a second volume of dialysate, equal to the first volume, from the dialysate compartment of the dialyzer;

(f) means for creating a volumetrically closed hydraulic loop in the dialysate circuit between said means for delivering the first volume and said means for removing the second volume;

(g) pressure-monitoring means for monitoring hydraulic pressure in the closed loop against pressure alarm limits;

(h) means for effecting a preselected net passage of liquid from the blood compartment through the dialysis membrane to the dialysate compartment, said means comprising ultrafiltrate removal means situated in the closed loop, said ultrafiltrate removal means being operable to remove a preselected volume of liquid from the closed loop; and

(i) self-test means operative to perform, upon actuation, an automatic test of said means for effecting a preselected net passage of liquid from the blood compartment through the dialysis membrane to the dialysate compartment, wherein, during the test, said ultrafiltrate removal means removes a preset volume of liquid from the closed loop and said pressure monitoring means monitors a corresponding drop in pressure in the closed loop for a preset amount of time.

2. A kidney dialysis machine as recited in claim **1** wherein said ultrafiltrate removal means comprises an ultrafiltration flow meter situated in the dialysate circuit between said means for delivering the first volume and said means for delivering the second volume, the ultrafiltration flow meter operable to remove a preselected volume of liquid from the dialysate circuit between said means for delivering the first volume of dialysate and said means for delivering the second volume of dialysate.

5,486,287

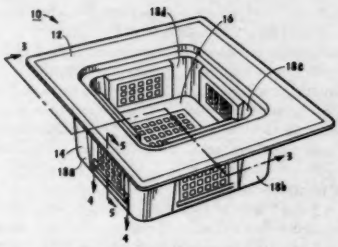
WASTEWATER STRAINING DEVICE

Gary Murphy, San Diego, and Raymond Matthias, Vista, both of Calif., assignors to Murphy Marketing, Inc., San Diego, Calif.

Filed Sep. 26, 1994, Ser. No. 317,138
Int. Cl.[6] B01D *29/35*
U.S. Cl. 210—164 **20 Claims**

1. A device for preventing the passage of particulate matter into a wastewater drainage system, said device comprising:

a strainer frame including a base portion, an annular flange portion substantially parallel to said base portion and four side walls interconnecting said base portion and said annular flange portion, said annular frame portion defining an inlet,



said base portion defining a primary outlet and at least one of said side walls defining a secondary outlet;

a primary filter covering said primary outlet such that said primary filter prevents passage of particulate matter through said primary outlet;

a secondary filter covering said secondary outlet such that said secondary filter prevents passage of particulate matter through said secondary outlet; and

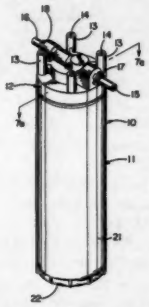
a linear handle rigidly attached to said frame, said handle being positioned to be substantially coplanar with said annular flange portion of said frame.

5,486,288

MOUNTING HEAD WITH SAFETY SHUT-OFF VALVE FOR REPLACEABLE FILTER CARTRIDGE

Ralph F. Stanford, Clinton, Iowa, and Stephen E. Gatz, Galt, Ill., assignors to Elkay Manufacturing Company, Oak Brook, Ill.

Division of Ser. No. 9,566, Jan. 26, 1993, Pat. No. 5,336,406.
This application Apr. 12, 1994, Ser. No. 226,639
Int. Cl.[6] B01D *27/08;27/10*
U.S. Cl. 210—235 **14 Claims**



1. A mounting head for receiving a replaceable filter cartridge enclosing a filter medium and having at one end concentric entrance and exit passages confined within an axially outwardly projecting annular wall and a concentric, axially outwardly projecting hollow stem, respectively, and said filter cartridge also having radially outwardly projecting mounting means disposed on said annular wall for securing and locking said filter cartridge to said mounting head,

said mounting head comprising, in combination,

means defining inlet and outlet ports in said mounting head and inlet and outlet passages connected thereto for communicating fluid respectively to and from said entrance and exit passages of said filter cartridge,

an outer cavity and an intermediate cylindrical recess formed in said mounting head for sealingly receiving said annular wall of said filter cartridge therein, said mounting head inlet passage communicating with said cylindrical recess,

a hollow inner sleeve having a central bore disposed concentrically within said cylindrical recess, said central bore communicating with said mounting head outlet passage and being

dimensioned and disposed to sealingly receive said hollow stem of said filter cartridge therein,

circumferentially disposed mounting means located in said outer cavity for cooperating with said filter cartridge mounting means for permitting quick locked connection and unlocked disconnection of said filter cartridge to and from said mounting head incident to axial rotation of said filter cartridge in opposite directions, respectively, relative to said mounting head,

and valve means disposed in said inlet passage, said valve means being biased to a normally closed position and adapted to be opened incident to axial rotation of said filter cartridge into fully locked connection with said mounting head.

5,486,289

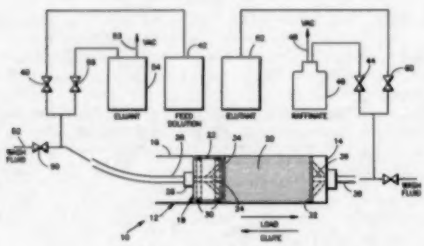
SYSTEM FOR MECHANICALLY STABILIZING A BED OF PARTICULATE MEDIA

Edward D. McCullough, Riverside, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 6, 1994, Ser. No. 301,106

Int. Cl.[6] B01D *15/04;15/08;53/02*

U.S. Cl. 210—289 **4 Claims**



1. A system for mechanically stabilizing a bed of particulate media which undergoes changes in volume during operation, comprising:

a) a tubular column being closed and ported at a first end and having an open second end, said tubular column containing a bed of particulate media;

b) a piston assembly supported in said column for retaining said bed of particulate media, said piston assembly, comprising:

i) a piston having at least one opening therethrough for conveying a fluid through said piston to said bed;

ii) means for attaching a fluid connection to said piston in fluid communication with said opening, wherein said fluid connection is movable relative to said tubular column;

iii) resilient sealing means arranged about said piston to provide sealing engagement of said piston and said column and to provide proper alignment therebetween; and,

iv) porous barrier elements positioned in said column and defining means for preventing the undesired escape of particulate media through said tubular column port and through said piston opening;

said tubular column port and fluid connection being connectable to either a source of fluid or vacuum wherein said connection of said tubular column port and said fluid connection to either said source of fluid or vacuum defines means for drawing fluid, through said bed in either direction generally parallel to the longitudinal axis of said tubular column at a pressure below ambient, and for causing said piston to respond at said pressure below ambient to changes in volume of the particulate media so as to continually compress and compact the particulate media regardless of the direction of fluid flow.

5,486,290

FLUID FILTER COLLECTOR WITH OPPOSED RIBS

Edward A. McGinness, New Philadelphia, Ohio, and Gary McHone, Beloit, Wis., assignors to Harvard Corporation, Evansville, Wis.

Continuation of Ser. No. 862,783, Jan. 9, 1992, abandoned. This application Feb. 28, 1995, Ser. No. 396,348

Int. Cl.[6] B01D *29/54;35/00*

U.S. Cl. 210—323.2 **9 Claims**

1. A pressurized axial flow fluid filter having a liquid tight container with at least one inlet port and outlet port, and a plurality of filter elements having wound layers of tissue, said filter elements having a generally cylindrical shape and an inner core defining flow path extending from the filter elements to the outlet port, and a fluid collector located between and engaging the two filter elements, the fluid collector comprising:

a) an annulus arranged perpendicular to the flow path and which has a top surface which is engaged against a first filter element, the top surface extending substantially perpendicular to the flow path;

b) a plurality of concentric annular ribs coaxial with the annulus and having a top surface substantially coplaner with the top surface of the annulus, the outer annular rib having a rim annulus;

c) a plurality of radial ribs which extend between the annulus and the annular ribs, wherein the radial ribs extend axially beneath the rim annulus and annular ribs, and wherein the radial ribs have a bottom surface substantially parallel to and beneath the top surface of the annular ribs, the radial rib bottom surfaces engaged against an axial end of a second filter element having wound layers of tissue beneath the first filter element, wherein the radial ribs define a plurality of radial flow passages between the first and second filter elements which direct fluid from the filter elements to the flow path and the annular ribs define a plurality of axial flow passages which direct fluid into the radial flow passages.

5,486,291

ECOLOGICAL FLUIDIZED BED METHOD FOR THE TREATMENT OF POLLUTED WATER

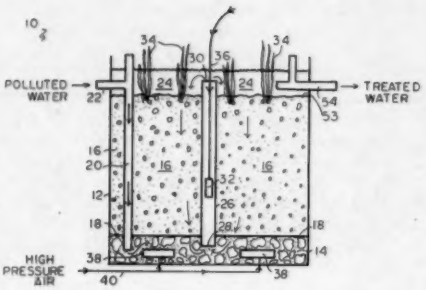
John H. Todd, Falmouth, Mass., and James M. Shaw, Shelburne, Vt., assignors to Ocean Arks International, Inc., Falmouth, Mass.

Filed Nov. 10, 1993, Ser. No. 149,964

Int. Cl.[6] C02F *3/08*

U.S. Cl. 210—602 **27 Claims**

1. A method for the treatment of polluted water in a fluidized bed system to provide treated water, which method comprises:



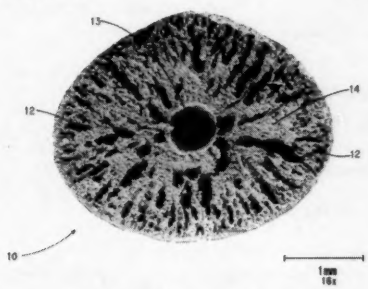
a) providing a housing having first and second adjacent chambers therein, said first and second chambers connected to permit the flow of circulated polluted water between said first and second chamber in said housing;
b) introducing polluted water to be treated at a flow-through rate into said first chamber;
c) maintaining in said second chamber circulating polluted water with semi-buoyant particulate media, having a specific gravity of about 0.9 to 1.0, in the presence of an ecosystem means for the treatment of the polluted water;
d) maintaining in said first chamber circulating polluted water essentially free of particulate media;
e) circulating the polluted water between the first and second chambers at a rate about ten times or greater than the flow-through rate of the polluted water; and
f) withdrawing from the housing a treated water essentially free of particulate media.

5,486,292

ADSORBENT BIOCATALYST POROUS BEADS

Thomas I. Bair, Wilmington, Del., and Carl E. Camp, Ponca City, Okla., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 3, 1994, Ser. No. 205,689
Int. Cl.[6] C02F *3/10*
U.S. Cl. 210—616 **7 Claims**



5. A process for detoxification of an aqueous waste stream containing an organic chemical contaminant, comprising the steps of

passing the waste stream through, a bioreactor in which bacterial biocatalyst material is supported within porous synthetic organic polymeric beads and activated carbon powder is dispersed throughout the polymer of the beads, wherein the beads are formed from an aramid polymer and have a microporosity characterized by a BET specific surface area of at least 400 m^2/g amd macropores characterized by a mercury intrusion volume in the range of 1.8 to 2.5 cubic centimeters per gram

adsorbing the organic contaminant onto the activated carbon powder particles of the bioreactor bead,

bacteria located in the macropores of the bead being the biocatalyst metabolizing the adsorbed chemical contaminant to water, carbon dioxide and/or nitrogen and thereby regenerating adsorbent capacity of the carbon powder, and

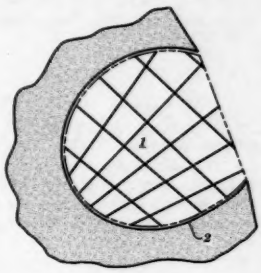
discharging from the bioreactor an aqueous stream that is substantially free of the contaminant.

5,486,293

REMOVAL OF SMALL EXOGENOUS MOLECULES FROM BIOLOGICAL FLUIDS

Egisto Boschetti, Croissy; Pierre Girot, Paris, and Luc P. Guerrier, Chilly-Mazarin, all of, France, assignors to Hemasure, Inc., Marlborough, Mass.

Filed Mar. 21, 1994, Ser. No. 215,201
Int. Cl.[6] B01D *15/00;15/08*
U.S. Cl. 210—635 **16 Claims**



1. A method for removing contaminants from a biological fluid comprising bringing said biological fluid into contact with a cross-linked hydrophobic polymer network overlaying, but not covalently bound to a porous mineral oxide matrix, said mineral oxide matrix having interior porous volume substantially filled by said hydrophobic polymer network, said mineral oxide matrix having interior porous volume free or hydrophilic polymers, whereby hydrophobic and amphiphilic molecules of molecular weight below 10,000 daltons are simultaneously removed from said biological fluid.

5,486,294

METHOD OF INHIBITING BARIUM SULFATE AND STRONTIUM SULFATE SCALE AT LOW PH

J. Michael Brown, The Woodlands, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 30, 1994, Ser. No. 316,611
Int. Cl.[6] C02F *5/10*
U.S. Cl. 210—674 **4 Claims**

1. A method of controlling the formation and deposition of barium and strontium scale forming salts in an aqueous water softening system resin regeneration stream interface zone having a pH of from about 1 to about 4, wherein acid regenerant is neutralized with oilfield produced water, comprising adding to said aqueous system a substoichiometric amount sufficient for the purpose of a treatment solution comprising polyepoxysuccinic acid.

5,486,295

METHOD FOR TREATING POLYMER-CONTAINING WATERS TO ALLOW USE AS COOLING TOWER MAKEUP

Paul R. Young, Wheaton, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Dec. 12, 1994, Ser. No. 354,389

Int. Cl.[6] C02F *5/12*

U.S. Cl. 210—701 **11 Claims**

1. A method for recycling boiler blowdown water containing a water soluble polymer which forms deposits on heat transfer surfaces when said water is added to a recirculating cooling water system, the water in said cooling water system containing at least 100 ppm of hardness calculated as $CaCO_3$, which comprises the steps of:

a) adding to the boiler blowdown water containing the water soluble polymer from 0.01 to 10 parts by weight of a water soluble persulfate salt per each part by weight of polymer contained in the water;

b) reacting the persulfate salt with the water soluble polymer contained in the water for a sufficient period of time to reduce the molecular weight of the water soluble polymer; and then,

c) adding the water to said recirculating cooling water system wherein the amount of deposit formed on the heat transfer surfaces of the recirculating cooling water system is reduced.

5,486,296

DETOXIFICATION FOR QUATERNARY AMMONIUM COMPOUNDS WITH LIGNOSULFONATES

Joseph C. Petrille, III, North Wales; Stephen R. Vasconcellos, Doylestown, and Michael W. Werner, Warrington, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 1, 1995, Ser. No. 396,941

Int. Cl.[6] C02F *1/66*

U.S. Cl. 210—749 **6 Claims**

1. A method of detoxifying water containing quaternary ammonium compounds toxic to aquatic organisms comprising adding thereto an amount of a lignosulfonate sufficient to neutralize the toxicity of the quaternary ammonium compounds to aquatic organisms.

5,486,297

DYE FADING PROTECTION FROM SOIL RELEASE AGENTS

Edgar M. Marin-Carrillo; Luis A. Amestica; Francisco R. Figueroa, all of Caracas, and Ana M. Ramirez-Semeco, El Valle, all of, Venezuela, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 14, 1994, Ser. No. 259,724

Int. Cl.[6] D06M *10/08;* **C11D** *3/37*

U.S. Cl. 252—8.6 **12 Claims**

1. A method of reducing dye fading of a fabric comprising depositing on the fabric a soil release agent having an absorptivity of at least about 1×10^{-5} $(ppm\text{-}cm)^{-1}$ in the wavelength range between about 200 nanometers and about 700 nanometers, the soil release agent being a water-soluble or water-dispersible soil release agent comprising at least about 10% by weight of a substantially linear sulfonated poly-ethoxy/propoxy end-capped ester having molecular weight ranging from about 500 to about 8,000, the ester consisting essentially of on a molar basis:

i) from about 1 to about 2 moles of sulfonated poly-ethoxy/propoxy end-capping units of the formula:

$(MO_3S)(CH_2)_m(CH_2CH_2O)(RO)_n$ — wherein M is a salt-forming cation, m is 0 or 1, R is ethylene, propylene or a mixture thereof, and n is from 0 to 2; and mixture thereof;

ii) from about 0.5 to about 66 moles of units selected from the group consisting of:

a) oxyethyleneoxy units;

b) a mixture of oxyethyleneoxy and oxy-1,2-propyleneoxy units wherein said units are present in an oxyethyleneoxy to oxy-1,2-propyleneoxy mole ratio ranging from 0.5:1 to about 10:1; and

c) a mixture of a) or b) with poly(oxyethylene)oxy units wherein said poly(oxyethylene)oxy units have a degree of polymerization of from 2 to 4; provided that when said poly(oxyethylene)oxy units have a degree of polymerization of 2, the mole ratio of poly(oxyethylene)oxy units to total group ii) units ranges from 0:1 to about 0.33:1; and when said poly(oxyethylene)oxy units have a degree of polymerization of 3, the mole ratio of poly(oxyethylene)oxy units to total group ii) units ranges from 0:1 to about 0.22:1; and when said poly(oxyethylene)oxy units have a degree of polymerization of 4, the mole ratio of poly(oxyethylene)oxy units to total group ii) units ranges from 0:1 to about 0.14:1;

iii) from about 1.5 to about 40 moles of terephthaloyl units; and

iv) from 0 to about 26 moles of 5-sulfoisophthaloyl units of the formula —(O)C(C_6H_3)(SO_3M)C(O)— wherein M is a salt forming cation.

5,486,298

FIBER TREATMENT COMPOSITIONS

Takayuki Aso; Isao Ona, and Masaru Ozaki, all of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Filed Feb. 24, 1995, Ser. No. 393,757

Claims priority, application Japan, Feb. 25, 1994, 6-052774

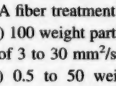
Int. Cl.[6] D06M *13/50;* **C08K** *5/54*

U.S. Cl. 252—8.6 **22 Claims**

1. A fiber treatment composition comprising:

(A) 100 weight parts of dimethylpolysiloxane having a viscosity of 3 to 30 mm^2/s at 25° C.;

(B) 0.5 to 50 weight parts of a polyoxyalkylene-functional diorganopolysiloxane having the formula:



wherein Q is a group having the formula:

$$—RO(C_3H_6O)_a(C_2H_4O)_bR^1$$

wherein R denotes an alkylene group having from 2 to 5 carbon atoms, R^1 is a radical selected from the group consisting of a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms, a —$COCH^3$ group, and —COR^2COOH groups wherein R^2 is a divalent hydrocarbon group having from 1 to 15 carbon atoms, a has a value of 1 to 15, b has a value of 1 to 15, with the proviso that the ratio of a to b is from 0.1 to 10, the units expressed by $(C_3H_6O)_a$ in the formula constitute a block, the units expressed by $(C_2H_4O)_b$ constitute a block, and x has a value of at least 1; and

(C) 0.003 to 1 weight parts of an antioxidant selected from the group consisting of:

(i) an amine-containing antioxidant;

(ii) a phenol-containing antioxidant; and

(iii) a mixture of (i) and (ii).

5,486,299

WEAR-RESISTANT LUBRICANT COMPOSITION

Yoshio Fuwa; Kouji Saitou, both of Aichi, and Jiro Yamashita, Kanagawa, all of, Japan, assignors to Dow Corning Asia, Ltd, Tokyo, and Toyota Motor Company, Aichi, both of, Japan

Filed Nov. 2, 1994, Ser. No. 333,462

Claims priority, application Japan, Nov. 2, 1993, 5-274576

Int. Cl.[6] C10M *107/44;* C02F *1/00;3/10*

U.S. Cl. 252—12 1 Claim

1. A wear resistant lubricant composition comprising from 50 to 73 weight percent of a binder consisting essentially of at least one member selected from the group consisting of polyamidimide resins and polyamide resins, and, as solid lubricants, from 3 to 15 weight percent of polytetrafluoroethylene, from 20 to 30 weight percent of molybdenum disulfide, and from 2 to 8 weight percent of graphite; wherein the total concentration of said solid lubricants constitutes from 27 to 50 percent of the total weight of said composition.

5,486,300

LUBRICATING COMPOSITIONS

Mary F. Salomon, Mayfield Village; Kirk E. Davis, Chester Township; Jack L. Karn, Richmond Heights, and John M. Cahoon, Mentor, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 688,195, Apr. 19, 1991, abandoned. This application Jul. 21, 1994, Ser. No. 278,344

Int. Cl.[6] C10M *125/00*

U.S. Cl. 252—18 45 Claims

1. A lubricating oil composition, comprising: a major amount of an oil of lubricating viscosity; and

(A) an amount of at least one alkali metal overbased salt of an acidic organic compound sufficient to provide at least about 0.005 equivalents up to about 0.025 equivalents of alkali metal per 100 grams of the lubricating composition;

(B) at least about 1.13% by weight up to about 5% by weight of at least one dispersant;

(C) at least one metal dihydrocarbyl dithiophosphate; and

(D) at least one antioxidant, provided that the lubricating oil composition is free of calcium overbased sulfonate; provided that the composition contains less than about 0.08% by weight calcium; and provided that (C) and (D) are not the same.

5,486,301

MODIFIED SUCCINIMIDES AS DISPERSANTS AND DETERGENTS AND LUBRICANT AND FUEL COMPOSITIONS CONTAINING SAME

Guy P. Abramo, Herndon, Va.; David A. Blain, Mount Laurel, and Angeline B. Cardis, Florence, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 912,369, Jul. 13, 1992, Pat. No. 5,435,812, and a continuation-in-part of Ser. No. 540,722, Jun. 21, 1990, abandoned. This application May 12, 1995, Ser. No. 440,398

Int. Cl.[6] C10M *133/56*

U.S. Cl. 252—51.5 A 6 Claims

1. A lubricant composition comprising a major amount of an oil of lubricating viscosity or grease prepared therefrom and between about 0.1 to about 10% by weight of the total compositions of a reaction product obtained by reacting an aromatic acid bis(polyether ester) and a substituted succinimide in molar, less than molar or more than molar amounts, where the pressure is autogenous or varies from ambient to slightly higher pressures of about 100 psi, and at temperatures of from about 85° to about 225° C. for a time sufficient to obtain a desired aromatic acid bis(polyether ester) modified succinimide which time varies from 1 to about 24 hours or more.

5,486,302

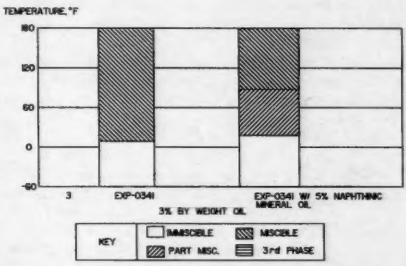
LUBRICANT COMPOSITION FOR FLUORINATED REFRIGERANTS USED IN COMPRESSION REFRIGERATION SYSTEMS

Glenn D. Short, Midland, Mich., assignor to CPI Engineering Services, Inc., Midland, Mich.

Continuation of Ser. No. 770,615, Oct. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 642,464, Jan. 17, 1991, abandoned. This application Dec. 19, 1994, Ser. No. 358,968

Int. Cl.[6] C10M *105/34*

U.S. Cl. 252—56 S 3 Claims



1. A fluid composition comprising a non-chlorinated, fluorinated hydrocarbon refrigerant and an ester lubricant base having a viscosity suitable for compression refrigeration and miscible in said non-chlorinated, fluorinated, hydrocarbon refrigerant in the range from 20° F.–80° F. at a percent by weight of lubricant base to refrigerant of at least 3%, said lubricant base consisting essentially of an ester made by reacting mono-pentaerythritol with an acid blend consisting of substantially 70% branched 3, 5, 5, trimethylhexanoic acid and a remainder comprising a mixture of substantially linear carboxylic C_7, C_8, and C_{10} acid.

5,486,303

PROCESS FOR MAKING HIGH DENSITY DETERGENT AGGLOMERATES USING AN ANHYDROUS POWDER ADDITIVE

Scott W. Capeci, North Bend; James W. Osborn, Cincinnati, both of Ohio; Adrian J. W. Angell, Strombeek-Bever, and Paul van Dijk, Putte, both of, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 113,572, Aug. 27, 1993, Pat. No. 5,366,652. This application Aug. 3, 1994, Ser. No. 283,131

Int. Cl.[6] C11D *11/00;17/06*

U.S. Cl. 252—89.1 16 Claims

1. A process for preparing high density detergent agglomerates comprising the steps of:

(a) charging a viscous surfactant paste into a mixer/densifier wherein said surfactant paste has a viscosity of from about 5,000 cps to about 100,000 cps and contains from about 70% to 95%, by weight of said surfactant paste, of a detersive surfactant and the balance water;

(b) adding from about 1% to about 70% by weight of an anhydrous material selected from the group consisting of carbonates, sulfates, carbonate/sulfate complexes, tripolyphosphates, tetrasodium pyrophosphate, citrates, aluminosilicates, cellulose-based materials and organic synthetic polymeric absorbent gelling materials into said surfactant paste just prior to entrance into said mixer/densifier to absorb at least a minor amount of said water from said surfactant paste; and

(c) agglomerating said surfactant paste and said anhydrous material by treating said surfactant paste and said anhydrous material initially in a high speed mixer/densifier and subsequently in a moderate speed mixer/densifier so as to form detergent agglomerates having a density of at least about 650 g/l.

5,486,304

FRAGRANT DENTURE CLEANSER COMPOSITION

Anthony B. Eoga, Boonton, and Richard G. Moran, Lake Hopatcong, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 160,378, Dec. 1, 1993, Pat. No. 5,384,062. This application Oct. 13, 1994, Ser. No. 322,889

Int. Cl.[6] A61K *7/30;* **C11D** *3/39;3/48;17/00*

U.S. Cl. 252—99 **41 Claims**

1. A denture cleansing composition derived from a mixture comprising:

(a) a pregranulated compressed mixture of an anhydrous perborate in an amount of from about 5% to about 25% by weight of said composition, a perborate monohydrate, and a lubricant and compression aid, wherein the weight ratio of anhydrous perborate to said perborate monohydrate in said pregranulated mixture is from about 1:3 to about 1:1, the amount of perborate monohydrate in the premixture being reflected by the ratio; and

(b) a monopersulfate compound in an amount of from about 15% to about 27% by weight of said composition; and

(c) non-granulated perborate monohydrate wherein the total amount of granulated and non-granulated perborate monohydrate is in an amount of from about 30% to about 60% by weight of said denture cleansing composition; and

(d) an effective amount of a sequestering agent to remove calcium deposits and calculus deposits.

5,486,305

NAIL POLISH REMOVER

Joseph R. Faryniarz, Oxford, and Philip E. Miner, Newtown, both of Conn., assignors to Chesebrough-Pond's USA Co., Greenwich, Conn.

Filed Sep. 19, 1994, Ser. No. 308,233

Int. Cl.[6] C09D *9/00;* **C11D** *7/50*

U.S. Cl. 252—162 **9 Claims**

1. A polish-lacquer removing composition consisting essentially of:

(i) from about 60 to about by 80% by weight of a volatile organic solvent selected from the group consisting of acetone, ethyl acetate and combinations thereof;

(ii) from about 3 to about 20% by weight of a C_4–C_{30} diester exhibiting a vapor pressure of less than 0.1 mm at 20° C.;

(iii) from about 5 to about 20% by weight of water;

(iv) optionally from 0 to about 20% by weight of propylene carbonate;

(v) optionally from 0 to about 20% by weight of a humectant; and

(vi) optionally from 0 to about 10% by weight of an emollient.

5,486,306

FOAM CONTROL AGENTS

Jacqueline L'Hostis, Woluwe-Saint-Lambert; Franck A. D. Renauld, Gistoux, and George C. Sawicki, Rixensart, all of, Belgium, assignors to Dow Corning, S.A., Seneffe, Belgium

Filed Jun. 25, 1993, Ser. No. 81,873

Claims priority, application United Kingdom, Jul. 9, 1992, 9214567

Int. Cl.[6] B01D *19/04;* **C11D** *3/00*

U.S. Cl. 252—174.15 **20 Claims**

1. A foam control agent which is free from hydrocarbon oils and comprises (A) from 70 to 99.9 parts by weight of an organopolysiloxane of which the siloxane units consist essentially of 0 to 60% of units of the general formula (i)

$$R_aSiO_{\frac{4-a}{2}}$$

wherein R denotes a hydrocarbon group having up to 8 carbon atoms and a has a value of from 0 to 3, and for 40 to 100% of units of the general formula (ii)

$$R_bR''_cSiO_{\frac{4-b-c}{2}}$$

wherein R is as defined above R" denotes a group $—Z_z—R'$ wherein R' denotes an alkyl group having from 9 to 35 carbon atoms, Z denotes a linking group between silicon and R' and z has a value of 0 or 1, b has a value of 0, 1, or 2, c has a value of 1 or 2, and b+c has a value of 1, 2, or 3, provided more than 70% by weight of the carbon content of the organopolysiloxane is due to the groups R"; and (B) from 0.1 to 30 parts by weight of a finely divided hydrophobic particulate material.

5,486,307

LIQUID CLEANING COMPOSITIONS WITH GREASE RELEASE AGENT

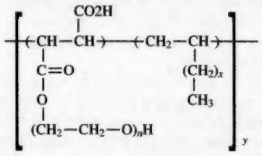
Anne-Marie Misselyn, Villers-l'Eveque; Marianne Mahieu, Ferrieres, and Rita Erilli, Rocourt, all of, Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.

Continuation-in-part of Ser. No. 155,358, Nov. 22, 1993. This application Nov. 15, 1994, Ser. No. 336,935

Int. Cl.[6] C11D *3/37;3/04;3/12;1/02*

U.S. Cl. 252—174.24 **28 Claims**

1. A stable microemulsion composition comprising approximately by weight: 0.1% to 20% of an anionic surfactant, 0.1% to 50% of a cosurfactant, 0.1% to 10% of a grease release agent, 0.1% to 10% of a water insoluble hydrocarbon or a perfume and the balance being water, wherein said grease release agent is selected from the group consisting of a copolymer characterized by the formula:



wherein n is 5 to 14, x is 7 to 19, and y is of such a value as to provide a molecular weight 10,000 to 30,000.

5,486,308

COMPOSITIONS COMBINATIONS OF DESSICANTS AND VAPOR-CORROSION INHIBITORS

Donald P. Mayeaux, Prairieville, La., assignor to A+ Corp., Denham Springs, La.

Division of Ser. No. 990,041, Dec. 14, 1992, Pat. No. 5,324,448. This application Apr. 4, 1994, Ser. No. 222,709

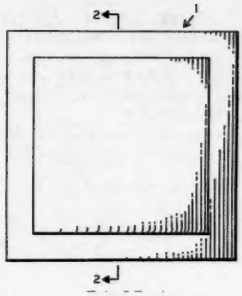
Int. Cl.[6] C23F *11/14;11/173*

U.S. Cl. 252—194 **2 Claims**

1. A composition for extending the service life of a vapor-corrosion inhibitor, the composition consisting essentially of:

(a) from about ten to about ninety-nine and nine-tenths percent by weight of a granular dessicant which gels upon exposure to water vapor and which is a sodium or potassium salt of poly(acrylic) acid; and

(b) from about one-tenth to about ninety percent by weight of a granular vapor-corrosion inhibitor which is chemically compatible with the dessicant and which is at least partially soluble in the gelled dessicant, the corrosion inhibitor being benzotriazole, tolytriazole, and dicyclohexylamine nitrite.



5,486,309
CHIRAL LIQUID CRYSTAL COMPOUNDS

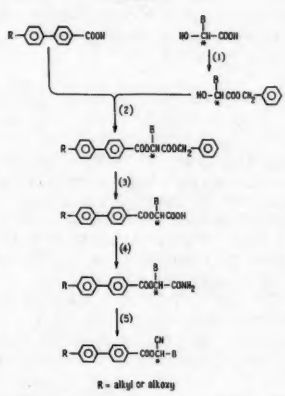
George W. Gray; David Lacey; Kenneth J. Toyne; Richard M. Scrowston, all of Hull; Ibrahim G. Shenouda, Hull; Lawrence K. M. Chan, Northolt; Madeline J. Bradshaw, Nr Newent; Victoria Brimmell, Earls Croome; Jennifer Constant, Powick; Edward P. Raynes, Malvern, all of, England; Adam Jackson, Trondheim, Norway, and Amarjit K. Samra, Wares, England, assignors to The Secretary of State for Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Division of Ser. No. 3,827, Jan. 3, 1993, Pat. No. 5,384,071, which is a continuation of Ser. No. 734,105, Jul. 24, 1991, abandoned, which is a continuation of Ser. No. 305,730, Feb. 1, 1989, abandoned. This application Sep. 22, 1993, Ser. No. 105,675

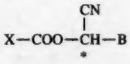
Claims priority, application United Kingdom, Jun. 23, 1986, 8615316

Int. Cl.[6] C09K *19/06;19/12;19/30;* G02F *1/13*

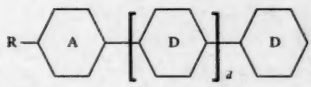
U.S. Cl. 252—299.60 8 Claims



1. A ferroelectric smectic liquid crystal mixture comprising an optically active dopant, said dopant having the structure



in which X is a group having the formula:



where R is selected from hydrogen C_{1-12} alkyl or alkoxy, each of the rings D is the same or different and are independently selected from phenyl and halogen substituted phenyl, A is selected from phenyl, halogen substituted phenyl and trans-cyclohexyl, d is 0 or 1 and B is selected from C_{1-12} straight chain or branched chani alkyl and cyclohexyl provided that when d is 0 neither A nor D is halogen substituted phenyl.

5,486,310
LIQUID CRYSTALLINE MIXTURES HAVING A CHIRAL TILTED SMECTIC PHASE

Richard Buchecker, Zurich, Switzerland; Nina I. Chernova, Moscow, U.S.S.R.; Alexander V. Ivaschenko, Moscow, U.S.S.R.; Marina V. Loseva, Moscow, U.S.S.R.; Olga S. Petrashevich, Moscow, U.S.S.R.; Evgeniy P. Pozhidaev, Moscow, U.S.S.R.; Arnold Z. Rabinovich, Moscow, U.S.S.R., and Martin Schadt, Seltisberg, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J., and Niopic Moscow Research and Production Association, Moscow, U.S.S.R.

Continuation of Ser. No. 68,489, May 27, 1993, abandoned, which is a division of Ser. No. 883,245, May 7, 1992, Pat. No. 5,242,619, which is a continuation of Ser. No. 343,477, Apr. 26, 1989, abandoned. This application Feb. 18, 1994, Ser. No. 198,669

Claims priority, application Switzerland, Apr. 27, 1988, 1570/88

Int. Cl.[6] C09K *19/34;19/12;* C07C *69/76;* C02F *1/13*

U.S. Cl. 252—299.61 12 Claims

1. An optically active compound of the formula

wherein rings A, B and C each independently are 1,4-phenylene, which is unsubstituted or substituted with halogen, or is pyrimidin-2,5-diyl or pyridin-2,5-diyl, with the proviso that no more than one of the rings A, B or C is pyrimidin-2,5-diyl or pyridin-2,5-diyl; R^1 is a group $-(CH_2)_m-C^*HX^1-R^3$; R^2 is a group $-(CH_2)_n-C^*HX^2-R^4$; m and n each independently stand for the number 0 or 1; C* denotes a chiral carbon atom; X^1 and X^2 each independently are methyl or methoxy; R^3 and R^4 each independently are a group R, provided that R^3 is different from X^1 and R^4 is different from X^2; R is an C_{1-15} alkyl or an C_{2-15} alkenyl group, provided that R^1 and R^2 are not simultaneously 2-alkyl when rings A, B and C together are unsubstituted p-terphenyl.

5,486,311
OPTICALLY ERASABLE READ-AND-WRITE LIQUID CRYSTAL/SIDE-CHAIN LIQUID CRYSTALLINE POLYMER COMPOSITION AND METHOD OF MAKING RECORDATION ON THE SAME

Ging-Ho Hsiue; Jow-Tsong Shy, both of Hsinchu; Jang-Jeng Liang, and Wen-Chang Chiang, both of Taoyuan, all of, Taiwan, Prov. of China, assignors to National Science Council, Taipei, Taiwan, Prov. of China

Filed Sep. 15, 1993, Ser. No. 121,768

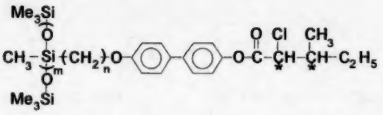
Int. Cl.[6] C09K *19/12;19/20*

U.S. Cl. 252—299.66 17 Claims

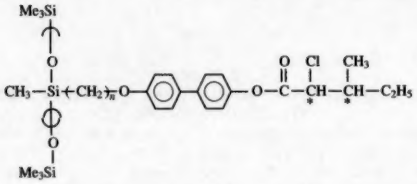
1. A liquid crystal/side chain liquid crystal polymer composition for use as an optical recording medium comprising:

(1) 45 to 85 wt % of a nematic ester liquid crystal; and

(2) 15 to 55 wt % of a side-chain polymethylsiloxane liquid crystal polymer having a molecular weight between 4,000 to



10,000, wherein said side-chain polymethylsiloxane liquid crystal polymer is represented by the following formula:



where n and m are integers less than 30 and 120, respectively, and said n and m are selected such that the molecular weight of said side-chain polymethylsiloxane liquid crystal polymer is between 4,000 and 10,000.

5,486,312

HIGH TEMPERATURE STABLE GELS

Burton B. Sandiford, Balboa Island; Hoai T. Dovan, Yorba Linda, and Richard D. Hutchins, Placentia, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 940,301, Aug. 31, 1992, Pat. No. 5,246,073. This application Sep. 10, 1993, Ser. No. 119,715

Int. Cl.[6] **B01J** *13/00;* **C08F** *8/32;* **C09K** *3/00*

U.S. Cl. 252—315.1 **58 Claims**

22. A composition comprising:

(a) an ingredient selected from the group consisting of a water soluble, crosslinkable polymer selected from the group consisting of polymethacrylamides, polyacrylamides, acrylic acid-acrylamide copolymers, and acrylic acid-methacrylamide copolymers and polymerizable monomers capable of forming a crosslinkable polymer selected from the group consisting of polymethacrylamides, polyacrylamides, acrylic acid-acrylamide copolymers, and acrylic acid-methacrylamide copolymers;

(b) a crosslinking agent comprising hexamethylenetetramine;

(c) water; and

(d) a stabilizing agent selected from the group consisting of buffering agents having a buffering capacity at a pH greater than about 8, chelating agents, and mixtures thereof,

provided that, when the stabilizing agent comprises a buffering agent, the composition comprises at least 0.05 weight percent buffering agent; and, when the stabilizing agent comprises a chelating agent, the composition comprises at least 0.75 mole of chelating agent per mole of divalent cations dissolved in the composition.

34. A gel formed from the composition of claim **22**.

5,486,313

PROCESS FOR THE PREPARATION OF CARBON MONOXIDE AND/OR HYDROGEN

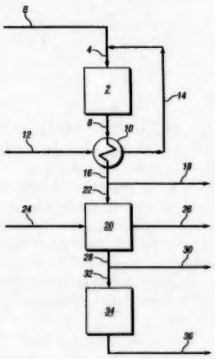
Krijn P. De Jong; Peter W. Lednor; Anna E. M. Oud; Ronald J. Schoonebeek; Koert A. Vonkeman, and Gerardus P. Van Der Zwet, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1994, Ser. No. 361,358

Claims priority, application European Pat. Off., Dec. 27, 1993, 93203705

Int. Cl.[6] **C07C** *1/02*

U.S. Cl. 252—373 **14 Claims**



1. A process for the preparation of carbon monoxide and/or hydrogen from a hydrocarbon feedstock, which process comprises subjecting the hydrocarbon feedstock in a first stage to a catalytic partial oxidation process comprising contacting a gaseous mixture comprising the hydrocarbon feedstock and an oxygen-containing gas, which gaseous mixture also comprises nitrogen, with a catalyst comprising as a catalytically active metal rhodium, iridium or platinum and subjecting at least a portion of the products of the first stage in a second stage to a process in which ammonia and/or hydrogen cyanide is removed.

5,486,314

CLEANING AGENT CONTAINING GLYCOL ETHERS

Oskar K. Wack, Stammham-Westerhofen, and Martin Hanek, Hilpoltstein, both of, Germany, assignors to O. K. Wack Chemie GmbH, Germany

Filed Jul. 16, 1993, Ser. No. 92,707

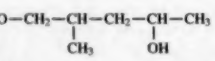
Claims priority, application European Pat. Off., Aug. 7, 1992, 92113503; Aug. 7, 1992, 92113504

Int. Cl.[6] **C11D** *7/32;7/26;7/50;* **C23G** *5/036;5/02*

U.S. Cl. 252—542 **13 Claims**

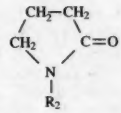
1. A cleaning agent for precision mechanics, optical and electronic components, circuit boards and electronic assembly units consisting of:

10–90% by weight of a dipropylene glycol monoether of the formula:



as carrying agent, whereby R_1 is a chain of carbon atoms of a length between 1 and 6 atoms, and

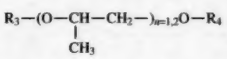
a compound selected from the group consisting of, a) 30–70% per weight of N-alkyl-lactame of the formula:



whereby R_2 is chain of carbon atoms of a length between 1 and 10 atoms,

b) 10–70% per weight of dihydro-2(3H) - furanone and

c) 10–50% per weight of at least one polypropylene glycol ether of the formula:



whereby R_3 is a chain of carbon atoms of a length between 1 and 6, and R_4 is hydrogen or a chain of carbon atoms of a length between 1 and 6 atoms.

5,486,315

LOW FOAM BRANCHED ALKYLDIMETHYLAMINE OXIDES

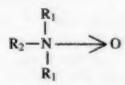
Chuen-Ing J. Tseng, Lawrenceville, N.J., assignor to Lonza Inc., Fair Lawn, N.J.

Filed May 20, 1994, Ser. No. 246,688

Int. Cl.[6] C11D *1/75;1/88;* **C07C** *291/04*

U.S. Cl. 252—547 **17 Claims**

1. An amine oxide having the formula:



wherein the R_1 groups are independently selected from C_1–C_4 alkyl or alkoxy groups and R_2 is a branched chain C_{11}–C_{16} alkyl group having from 3 to 4 methyl branches.

5,486,316

AQUEOUS LUBRICANT AND SURFACE CONDITIONER FOR FORMED METAL SURFACES

James P. Bershas, West Bloomfield; Timm L. Kelly, Birmingham, and Gary L. Rochfort, Troy, all of Mich., assignors to Henkel Corporation, Plymouth Meeting, Pa.

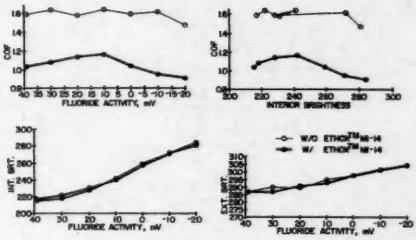
Continuation-in-part of Ser. No. 143,803, Oct. 27, 1993, which is a continuation-in-part of Ser. No. 109,791, Sep. 23, 1993, which is a continuation-in-part of Ser. No. 910,483, Jul. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 785,635, Oct. 31, 1991, abandoned, which is a continuation of Ser. No. 521,219, May 8, 1990, Pat. No. 5,080,814, which is a continuation of Ser. No. 395,620, Aug. 18, 1989, Pat. No. 4,944,889, which is a continuation-in-part of Ser. No. 57,129, Jun. 1, 1987, Pat. No. 4,859,351. This application Sep. 21, 1994, Ser. No. 309,839

Int. Cl.[6] C10M *173/02;133/04*

U.S. Cl. 252—547 **20 Claims**

1. A process for cleaning and finishing the surfaces of aluminum cans, said process comprising steps of:

(B) contacting aluminum cans bearing surface contamination selected from the group consisting of can drawing lubricants and aluminum fines with an aqueous alkaline cleaning composition having a pH in the range from about 11.0 to about 12.5 and containing at least 0.05 g/L of a mobility enhancer selected from the group consisting of quaternary ammonium salts and ethoxylated phosphate esters, the alkaline cleaning composition being maintained during the contacting at a



cleaning effective temperature and contacting being maintained for a cleaning effective time;

(C) removing the cans as treated in step (B) from contact with the alkaline cleaning composition and rinsing the surfaces of the cans that have been in contact with the alkaline cleaning composition with an aqueous rinse solution having a pH lower than that of the alkaline cleaning composition;

(G) removing the cans, subsequent to step (C), from contact with any aqueous liquid and drying the cans to produce cleaned and dried cans; and

(H) conveying the cleaned and dried cans from the end of step (G) via automatic conveying equipment to a location where the cans are lacquered or decorated by printing or both,

wherein the surfaces of the cleaned and dried cans conveyed in step (H) have a coefficient of surface friction not greater than about 1.0.

5,486,317

PROCESS FOR MAKING DETERGENT GRANULES BY NEUTRALIZATION OF SULPHONIC ACIDS

Andrew Dorset, Kingston Park, Great Britain, and Olivier Paquatte, Strombeek-Bever, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US93/00736, § 371 Date Aug. 10, 1994, § 102(e) Date Aug. 10, 1994, PCT Pub. No. WO93/16154, PCT Pub. Date Aug. 19, 1993

PCT Filed Jan. 27, 1993, Ser. No. 284,591

Claims priority, application European Pat. Off., Feb. 14, 1992, 92870026

Int. Cl.[6] C11D *1/12;11/00;11/04;17/06*

U.S. Cl. 252—549 **9 Claims**

1. A process for making detergent particles comprising the steps of:

providing a particulate neutralizing agent comprising 50% by volume of particles less than 5 μm in diameter and 90% by volume of particles less than 10 μm in diameter;

mixing a stoichiometric excess of said particulate neutralizing agent in a high shear mixer with an anionic surfactant in its acid form so as to neutralize said anionic surfactant; and

forming said detergent particles.

5,486,318

LIQUID-VAPOR CONTACT COLUMN

Kevin McKeigue, New York, and Ramachandran Krishnamurthy, Chestnut Ridge, both of N.Y., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Dec. 29, 1994, Ser. No. 366,350

Int. Cl.[6] B01F *3/04*

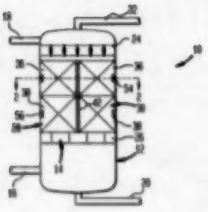
U.S. Cl. 261—112.2 **6 Claims**

1. A liquid-vapor contact column comprising:

a column shell;

at least one bed of structured packing located within said column shell;

said at least one bed of structured packing including a plurality of vertical stacks each formed by at least one pair of upper and lower levels of said structured packing;



said structured packing formed of a plurality of corrugated sheets oriented so that liquid-vapor contact occurs in a vertical direction of said column shell and said corrugated sheets of said upper level of said structured packing oriented at right angles with respect to said corrugated sheets of said lower level of said structured packing; and

means associated with each of said vertical stacks for inhibiting migration of liquid in a transverse, horizontal direction of said column shell thereby to promote constant liquid and vapor flow characteristics through each of said vertical stacks of said structured packing.

5,486,319

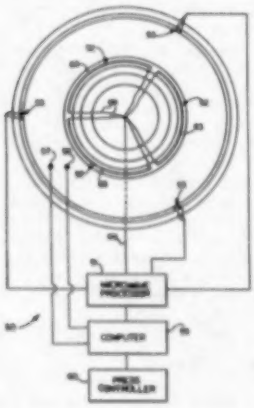
TIRE CURE CONTROL SYSTEM AND METHOD

W. Ross Stone, La Jolla; Robert L. Palmer, San Diego, both of Calif.; Virgil D. Mochel, Wadsworth, and Robert P. Karpinski, North Canton, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Dec. 29, 1993, Ser. No. 174,819

Int. Cl.[6] B29C *35/04; G01N 22/00*

U.S. Cl. 264—406 **19 Claims**



1. A method of controlling the cure of a rubber compound containing a reinforcing agent or filler, comprising the steps of closing a mold with the rubber compound therein, applying heat to the rubber compound to initiate curing of the rubber compound, passing a microwave signal through the rubber compound, measuring the attenuation of the microwave signal, calculating from the microwave attenuation measurements the rate of change of microwave attenuation, using the rate of change of microwave attenuation to determine when to issue a press opening signal, and automatically initiating a press opening sequence in response to the press opening signal.

5,486,320

METHOD OF DEPOLARIZING A FERROELECTRIC MATERIAL USING ELECTRICAL MEANS AND ITS APPLICATION TO OBTAIN A FERROELECTRIC MATERIAL OF REINFORCED DIELECTRIC STRENGTH

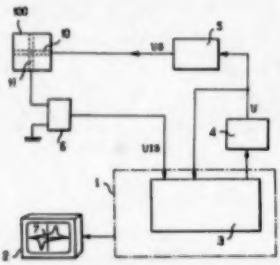
François Bauer, Saint-Louis, France, assignor to Institut Franco-Allemand de Recherches de Saint-Louis, Saint-Louis Cedex, France

Filed Jan. 5, 1994, Ser. No. 177,544

Claims priority, application France, Jan. 6, 1993, 93 00061

Int. Cl.[6] B29C *71/04*

U.S. Cl. 264—408 **11 Claims**



1. Method of depolarizing a ferroelectric material using electrical means, said material having been pre-polarized along a specific axis in at least one of its regions during a preceding phase; said method comprising the steps of:

applying a low-frequency alternating electric field to said material with the maximum amplitude of the field exceeding the coercive polarization field (E_c) of the said material parallel to a specific axis;

effecting a step-by-step decrease of the said amplitude to a specific minimum value of the amplitude of the applied electric field so that a predetermined value of residual polarization of said material is achieved; and

displaying residual polarization values of said material at each step of said step-by-step decrease, and comparing said displayed values to said predetermined value;

whereby said predetermined value of residual polarization can be reproducibly achieved for a plurality of said ferroelectric materials, and whereby an increased dielectric strength can be imparted to said ferroelectric materials.

5,486,321

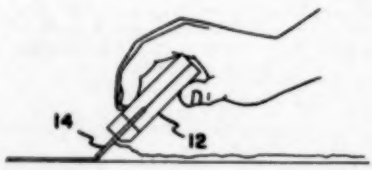
METHOD FOR AUTO BODY REPAIR

Gary W. Spatenka, Rte. 1, Box 271, Owatonna, Minn. 55060

Continuation of Ser. No. 160,894, Dec. 1, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 415,144

Int. Cl.[6] B32B *35/00*

U.S. Cl. 264—36 **11 Claims**



1. A method of auto body damage repair, comprising the steps of:

(a) distributing filler material over a damaged area;

(b) allowing the filler material to harden to a semi-pliable state;

(c) drawing a toothed tool across the filler material in substantially linear motion without back and forth stroking action to

smooth and shape the filler material without sanding, wherein the teeth lag behind and are drawn along by the rest of the tool;

(d) allowing the shaped material in the damaged area to harden to a sandable hardness; and,

(e) sanding the hardened filler material to a smooth finish to effect repair of the damaged area.

5,486,322

PRODUCTION OF MULTILAYER PRODUCTIVE COVERINGS ON CONVENTIONAL DIP MOLDING LINES

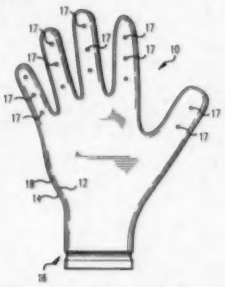
Ingbert E. Fuchs, Desoto, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

PCT No. PCT/US91/08954, § 371 Date Oct. 1, 1993, § 102(e) Date Oct. 1, 1993, PCT Pub. No. WO92/17124, PCT Pub. Date Oct. 15, 1992

Continuation-in-part of Ser. No. 678,838, Apr. 1, 1991, which is a continuation-in-part of Ser. No. 422,913, Oct. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 359,474, May 22, 1989, abandoned. This PCT application Nov. 27, 1991, Ser. No. 129,111

Int. Cl.[6] B29C *41/14;44/06*

U.S. Cl. 264—46.5 **48 Claims**



1. A method for making a multilayer glove, comprising the steps of:

dipping a substantially hand-shaped form into a first layer-forming solution to form a first layer on the hand-shaped form;

dipping the first layer into a gas-releasing solution that releases gas when heated to deposit a single substantially continuous layer of the gas-releasing solution on the first layer;

dipping the first layer into a second layer-forming solution to form a second layer, such that the gas-releasing solution is disposed between the first and second layers; and

heating the first or second layer such that gas is released from the gas-releasing solution to form a single substantially continuous gas-filled layer separating the first and second layers.

5,486,323

METHOD OF FORMING COMPACTED LAYER

Joseph A. McWilliams, Droitwich, United Kingdom, assignor to Ceramaspeed Limited, United Kingdom

Filed Nov. 14, 1994, Ser. No. 339,006

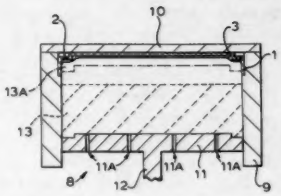
Claims priority, application United Kingdom, Nov. 25, 1993, 9324272

Int. Cl.[6] B29C *43/18*

U.S. Cl. 264—112 **46 Claims**

1. A method of forming a layer of compacted powdery microporous material in a container of substantially air-impervious material, which method comprises the steps of:

providing a container of substantially air-impervious material, the container having a base, side walls and at least one air outlet region;



providing a press tool for compacting powdery microporous material into the container, the press tool being movable in a direction toward and away from the base of the container;

providing barrier means adjacent at least the base of the container, the barrier means being adapted and arranged to substantially prevent passage therethrough of microporous material during compaction thereof, whilst permitting permeation of air displaced therefrom during such compaction;

providing means to enable the displaced air permeating at least part of the barrier means during compaction of the microporous material to flow laterally of the direction of movement of the press tool between the at least part of the barrier means and at least the base of the container;

introducing powdery microporous material between the container and the press tool; and

compacting the microporous material into the container by means of the press tool whereby air is displaced from within the microporous material, permeates the at least part of the barrier means, and flows laterally between the at least part of the barrier means and at least the base of the container toward the at least one air outlet region so as to be displaced from the container therethrough.

5,486,324

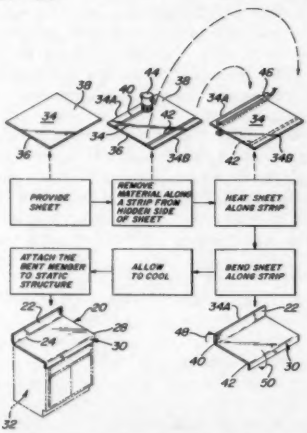
METHOD OF MAKING TIGHT RADIUS PLASTIC CORNER COMPONENTS FOR STATIC STRUCTURES

Frederick H. Klein, Jr., P.O. Box 411, Oley, Pa. 19547

Filed Jun. 6, 1994, Ser. No. 254,824

Int. Cl.[6] B29C *53/04*

U.S. Cl. 264—138 **12 Claims**


PROVIDE SHEET
REMOVE MATERIAL ALONG A STRIP FROM HIDDEN SIDE OF SHEET
HEAT SHEET ALONG STRIP
ATTACH THE BENT MEMBER TO STATIC STRUCTURE
ALLOW TO COOL
BEND SHEET ALONG STRIP

1. A method of forming a component for fixed securement to the interior of a static structure to provide a decorative surface, said method comprising the steps of:

(a) providing a molded unitary, non-laminated generally planar panel of a predetermined thickness of at least ¼ inch (0.64 cm) having an inner and an outer surface, said panel being molded of a filled thermoplastic material selected from the

group consisting of filled acrylics, filled polyesters, and filled acrylic-polyester blends to form a homogeneous body, said panel having a radius-cornered recess in one of said surfaces extending along a first predetermined line, whereupon the thickness of said panel along said first line is substantially less than the thickness of contiguous portions of said panel;

(b) heating said panel along said first line; and

(c) bending said panel along said first line at said recess to form a corner thereat, with a radius of curvature of said corner being no greater than 1 inch (2.54 cm) and without said corner being damaged.

5,486,325

SEAL MOLDING METHOD AND DEVICE

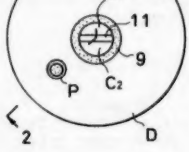
Hidetoshi Arima, Ohbu, Japan, assignor to Tokai Kogyo Co., Ltd., Aichi, Japan

Continuation of Ser. No. 73,341, Jun. 7, 1993, abandoned, which is a division of Ser. No. 689,697, Apr. 19, 1991, Pat. No. 5,244,704. This application Nov. 14, 1994, Ser. No. 338,897

Claims priority, application Japan, Apr. 27, 1990, 2-112258

Int. Cl.[6] B29C *47/22*

U.S. Cl. 264—167 **6 Claims**



1. A molding method for a seal comprising the steps of forming a first extrusion passage using a core disposed in an extrusion opening of a molding die for extruding a molding material to be molded into a hollow portion of said seal, supplying molding material to the first extrusion passage by a first molding material supply passage to continuously mold said hollow portion, forming a separate second extrusion passage in said extrusion opening for extruding a molding material to be molded into a bridge in the hollow portion of said seal, moving a molding material discharge pipe inserted into said molding die relative to a second molding material supply passage disposed in the molding die communicated with said second extrusion passage so as to intermittently supply molding material to said second extrusion passage independently of supply of molding material to said first extrusion passage so that the molding material is intermittently extruded from said second extrusion passage, whereby a first seal portion having no bridge in said hollow portion and a second seal portion having said bridge in said hollow portion are continuously molded.

2. A molding device for a seal comprising a molding die having an extrusion opening, a core disposed in said extrusion opening for defining a first extrusion passage for a seal, a first molding material supply passage communicated to said first extrusion passage, a second extrusion passage in the molding die for extruding a molding material to be molded into a bridge of said seal, a molding material flow control member movably mounted on said molding die relative to a second molding material supply passage in the molding die independently communicated to said second extrusion passage, said second molding material supply passage being closed and opened relative to said second extrusion passage by movement of said molding material flow control member.

5,486,326

PROCESS FOR CONVERTING POLYKETONES TO POLYESTERS

Palanisamy Arjunan, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 220,774, Apr. 11, 1994, Pat. No. 5,466,780. This application May 17, 1995, Ser. No. 443,137

Int. Cl.[6] B29C *47/00*

U.S. Cl. 264—176.1 **3 Claims**

1. A method to produce an article of manufacture comprising the steps of:

(a) contacting at least one polyketone, at least one peroxidizing agent, and a liquid carrier in a slurry oxidation reaction to produce a polyester product; and

(b) forming said article from the polyester product of step (a).

5,486,327

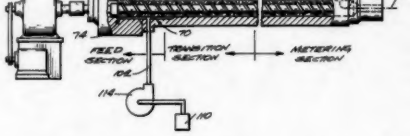
APPARATUS AND METHOD FOR INJECTING OR EXTRUDING COLORED PLASTIC

Peter F. Bemis; Loren C. Albrecht, and Steven F. Schick, all of Sheboygan, Wis., assignors to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Filed Jan. 21, 1994, Ser. No. 184,826

Int. Cl.[6] B29B *7/24;* **B29C** *47/10*

U.S. Cl. 264—211.21 **42 Claims**



1. Apparatus comprising

a barrel including a generally cylindrical inner wall defining a generally cylindrical chamber having a longitudinal axis, an inlet end for receiving solid material, and an outlet end for discharging molten material, said inner wall having therein a recess extending longitudinally of said chamber,

a screw which extends along said longitudinal axis and which is rotatably housed in said chamber,

a drive mechanism for rotating said screw about said axis, and

a conduit for introducing a liquid additive into said chamber, said conduit having a downstream end communicating directly with said recess so that additive flowing from said conduit flows directly into said recess prior to flowing from said recess into said chamber.

5,486,328

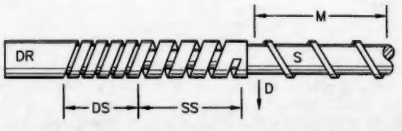
EXTRUSION SURGE SUPPRESSOR AND METHOD

Keith Luker, Little Falls, N.J., assignor to Randcastle Extrusion Systems, Inc., Cedar Grove, N.J.

Filed May 31, 1994, Ser. No. 250,909

Int. Cl.[6] B29C *47/46;47/50*

U.S. Cl. 264—211.23 **24 Claims**



1. An apparatus for extruding a polymer which is subject to periodic surges of pressure or flow rate, said apparatus comprising:

a barrel having an upstream portion and a downstream portion;

a hopper positioned and connected for delivering said polymer to said upstream portion of said barrel;

a shaft mounted for rotational movement about a longitudinal axis within said barrel;

drive means connected for rotating said shaft;

said shaft having a conveying screw flight and a metering screw flight arranged for conveying and metering said polymer downstream from said hopper through said barrel, wherein said surges are developed within said barrel;

said barrel having a discharge port located downstream of said hopper;

a surge suppressor connected to said shaft for reducing said surges in said polymer, said surge suppressor including a reverse screw flight on said shaft and located downstream of said discharge port for urging said polymer upstream toward said discharge port while permitting a portion of said polymer to flow in a downstream direction into said surge suppressor, said surge suppressor being capable of generating a pressure less than or substantially equal to a maximum pressure generated in said metering screw flight; and

sealing means located downstream of said surge suppressor.

14. A method for extruding a polymer using an extruder having a barrel with a discharge, a hopper communicating with an upstream portion of said barrel for delivering said polymer, a shaft rotationally mounted within said barrel and a drive means for rotating said shaft, said method comprising the steps of:

supplying polymer pellets through said hopper and into said barrel;

melting said polymer pellets to produce melted polymer;

conveying said melted polymer through said barrel with a conveying screw flight;

metering said melted polymer in said barrel with a metering screw flight, thereby generating a metering pressure and a metering flow rate;

suppressing surges in said metering pressure or said metering flow rate by generating a suppressing pressure less than or equal to a maximum metering pressure with a reverse screw flight positioned downstream of said discharge;

sealing against flow of said melted polymer downstream from said reverse screw flight; and

directing said melted polymer from said barrel between said metering screw flight and said reverse screw flight to said discharge.

5,486,329

AUTOMOTIVE DOOR TRIM AND METHOD FOR FABRICATING THE SAME

Katsuji Ueki, and Toyokazu Endo, both of Kanagawa, Japan, assignors to Kasai Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 206,284, Mar. 7, 1994, abandoned, which is a continuation of Ser. No. 968,411, Dec. 7, 1992, abandoned, which is a division of Ser. No. 796,668, Nov. 25, 1991, abandoned. This application Mar. 14, 1995, Ser. No. 403,562

Int. Cl.[6] B29C *43/00*

U.S. Cl. 264—273 **4 Claims**

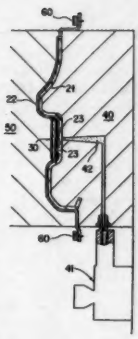
1. A method for fabricating an automotive interior component comprising a resin core member, a surface skin member integrally covering said resin core member, and an attachment member attached to a surface of the surface skin member, comprising the steps of:

providing a plurality of suitably located openings in the surface skin member within the periphery thereof;

retaining said surface skin member between upper and lower dies;

securing the attachment member on a die surface of said upper die;

supplying substantially molten resin material from a gate provided in the lower die;



mold press forming the automotive trim component into a curved contoured shape by engaging the upper and lower dies;

pushing the molten resin through the plurality of openings so that the molten resin material comes into contact with the attachment member, wherein the attachment member has a smaller surface area than the surface skin member; and

allowing the molten resin material to solidify into a resin core member such that the resin core member is securely attached to the attachment member.

5,486,330

PROCESS FOR PRODUCING PLASTIC TUBING OF A SELECTED LENGTH, WALL THICKNESS AND INNER DIAMETER

Theodore N. Westlake, III, and Duane K. Wolcott, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 3, 1994, Ser. No. 176,596

Int. Cl.[6] B29C *55/22*

U.S. Cl. 264—291 **1 Claim**

1. A process for producing plastic permeation or diffusion membrane tubing of a selected length, wall thickness and inner diameter, comprising the steps of:

selecting a commercially-available tubing which when stretched to such a selected length will provide tubing of the selected wall thickness and inner diameter;

inserting a length of a membrane support tubing into the lumens of the selected commercially-available plastic tubing at each of the commercially-available plastic tubing's ends, so that overlying, supported end portions of the commercially-available plastic tubing are preserved in an original wall thickness and inner diameter as the tubing is stretched;

heating the plastic tubing above its glass transition temperature over substantially all of the commercially-available plastic tubing's length; and

rapidly stretching the heated tubing by fixing one end of the tubing and applying a constant tensile force to a second end of the tubing until the tubing is of the selected length.

5,486,331

PROCESS FOR DEGREASING CERAMIC MOLDED BODIES

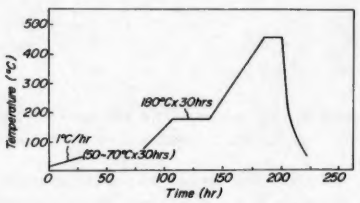
Masakazu Adachi, Nagoya, and Kouichi Imao, Kagamihara, both of, Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 944,028, Sep. 11, 1992, abandoned, which is a continuation of Ser. No. 726,733, Jul. 2, 1991, abandoned, which is a continuation of Ser. No. 436,641, Nov. 15, 1989, abandoned. This application Apr. 8, 1994, Ser. No. 225,073

Claims priority, application Japan, Nov. 15, 1988, 63-286886

Int. Cl.[6] C04B *33/32*

U.S. Cl. 264—344 **10 Claims**



1. A method of degreasing ceramic molded bodies, comprising the steps of:

forming a mixture into a plurality of ceramic molded bodies, said mixture comprising a ceramic material and an organic binder comprised of paraffin wax, and having a C/B ratio of 45:55 to 55:45, said C/B ratio being a volume ratio of said ceramic material to said organic binder;

determining a first contraction temperature of the ceramic molded bodies wherein the ceramic molded bodies undergo a first contraction while being heated;

embedding the ceramic molded bodies in alumina powder; and

heating the ceramic molded bodies in an oxidizing atmosphere for a predetermined period of time at a first constant temperature to remove said organic binder, said first constant temperature being immediately below said first contraction temperature, whereby a crack formation ratio of the ceramic molded bodies is less than 60% after degreasing.

5,486,332

METHOD FOR EVERTING A TUBULAR LINER BAG

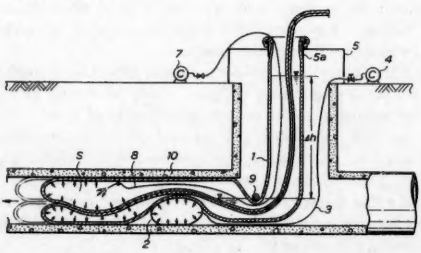
Takao Kamiyama, Hiratsuka, and Yasuhiro Yokoshima, Ibaraki, both of, Japan, assignors to Shonan Gosei-jushi Seisakusyo K.K., Kanagawa, and Yokoshima & Company, Ibaraki, both of, Japan

Filed Mar. 11, 1994, Ser. No. 209,139

Claims priority, application Japan, Mar. 12, 1993, 5-052356

Int. Cl.[6] B29C *63/36;* **B29L** *23/22*

U.S. Cl. 264—516 **2 Claims**



1. A method of providing a lining inside a pipe by everting a tubular liner bag inside a length of the inner wall of the pipe, comprising the steps of:

(a) preparing the tubular liner bag such that one end of an air hose connected to an air compressor is attached to a suitable position at an outer surface of the liner bag in an uneverted state thereof;

(b) everting the tubular liner bag by supplying water under pressure into a vertical entrance to the pipe;

(c) turning a head of the tubular liner bag toward a side of the pipe which is to be lined, when the head of the tubular liner bag hits upon the inner wall of the pipe;

(d) everting the tubular liner bag substantially deep into the pipe;

(e) stopping eversion of the tubular liner bag;

(f) deforming the everted tubular liner bag to a substantially J-shape with the head portion of the tubular liner bag corresponding to a toe portion of the J-shape so that when compressed air at a pressure not substantially higher than a pressure required to force the tubular liner bag to evert exists in the toe portion of the J-shaped tubular liner bag the air does not reach a long-leg section of the J-shaped tubular liner bag from said toe section; and

(g) operating said air compressor to supply compressed air into the head portion of the tubular liner bag via said air hose, to thereby increase an internal pressure in the head portion of the tubular liner to a value substantially higher than a value required to force the tubular liner bag to evert,

wherein said pipe has an inner diameter in the range of 200 to 350 mm, and has a slope of 20° or greater,

said step (c) comprises the step of turning the head of the tubular liner bag toward an upstream side of the pipe, and

said step (f) consists of lowering a press means into said vertical entrance to depress the everted tubular liner bag at a selected location.

5,486,333

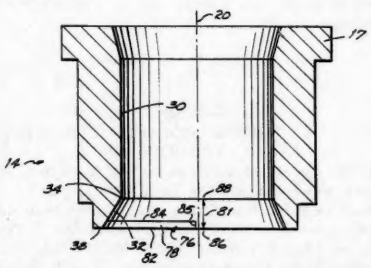
BLOW MOLDING EXTRUSION DIE WITH RECTANGULAR SLOTS

Harilos Mavridis, Blue Ash, and Ramesh N. Shroff, Cincinnati, both of Ohio, assignors to Quantum Chemical Corporation, Cincinnati, Ohio

Filed Sep. 16, 1993, Ser. No. 122,248

Int. Cl.[6] B29C *47/30;49/04*

U.S. Cl. 264—541 **9 Claims**



9. A method of extruding a material through a die into a tubular parison having a varying wall thickness around a perimeter of an annular cross-section of the parison, the method comprising the steps of:

feeding the material through a generally circular circumferential section of an annular material flow path having a flow channel depth formed between an internal surface of a die ring and an external surface of a mandrel located within said die ring; and

feeding the material through a circumferential fixed quadrilateral cutout section of the annular material flow path formed in one of the internal surface and the external surface of the die ring and mandrel, respectively, and having

an arcuate lower edge contiguous with a die exit and having a midpoint providing a maximum flow channel depth, said lower edge extending symmetrically in opposite directions from the midpoint along a curved path terminating at two ends on said one of said internal and external surfaces,

an arcuate upper edge located on said one of said internal and external surfaces upstream from the die exit, said upper edge being generally parallel to said lower edge and defining an intersection of said fixed cutout section with said one of said internal and external surfaces, and

two side edges located on said one of said internal and external surfaces, said side edges extending between ends of said upper and lower edges in directions substantially perpendicular to both of said upper and lower edges,

whereby material feeding through the circumferential fixed quadrilateral cutout section has a greater mass flow than material feeding through the generally circular circumferential section, and the material feeding through the circumferential fixed quadrilateral cutout section has a linear velocity approximately equal to a linear velocity of the material feeding through the generally circular circumferential section.

5,486,334

METHODS FOR INHIBITING METAL CORROSION IN AQUEOUS MEDIUMS

Orin Hollander, Warwick, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 17, 1994, Ser. No. 198,174

The portion of the term of this patent subsequent to Jan. 3, 2012, has been disclaimed.

Int. Cl.[6] C23F *11/14;11/16*

U.S. Cl. 422—16 **11 Claims**

1. A method for inhibiting the corrosion of ferrous metal surfaces in an aqueous system containing aggressive ions selected from the group consisting of cooper (I) and cooper (II) ions comprising adding to an aqueous system an effective corrosion inhibiting amount of a sulfono benzotriazole compound or salt thereof.

5,486,335

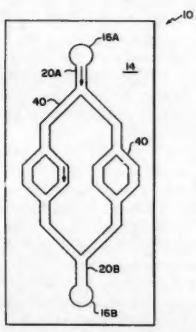
ANALYSIS BASED ON FLOW RESTRICTION

Peter Wilding, Paoli, and Larry J. Kricka, Berwyn, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 250,100, May 26, 1994, abandoned, which is a continuation of Ser. No. 877,701, May 1, 1992, abandoned. This application Apr. 24, 1995, Ser. No. 427,493

Int. Cl.[6] G01N *21/00*

U.S. Cl. 422—55 **47 Claims**



1. A device for detecting the presence of an analyte in a fluid sample, the device comprising:

a solid substrate microfabricated to define:

a sample inlet port; and

a mesoscale flow system comprising:

a primary sample flow channel extending from said inlet port; and

a fractal region, in fluid communication with said primary flow channel, comprising bifurcations leading to plural secondary flow channels; and

means for detecting a flow property of a fluid sample in said flow system as an indication of the presence of an analyte in the fluid sample.

5,486,336

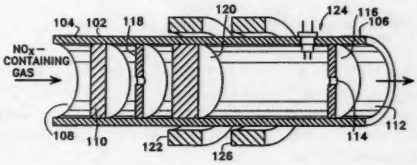
NOX SENSOR ASSEMBLY

Ralph A. Dalla Betta, Mountain View, Calif.; Daniel L. Reed, Boulder, Colo., and Priscilla Schubert, Pacifica, Calif., assignors to Catalytica, Inc., Mountain View, Calif.

Continuation of Ser. No. 536,888, Jun. 12, 1990, abandoned. This application Jun. 22, 1993, Ser. No. 80,679

Int. Cl.[6] G01N *25/20*

U.S. Cl. 422—90 **18 Claims**



1. A self-contained device for measuring NO_x concentration in a flowing gas stream comprising:

a. a container adapted to receive a flowing gas stream containing NO_x;

b. a NO_x reductant source situated within the container and adapted to introduce a NO_x reductant into the flowing gas stream containing NO_x;

c. a heater capable of heating the NO_x reductant source to a temperature above 260° C. thereby releasing NO_x reductant into the flowing gas stream containing NO_x; and

d. a heat flux sensor assembly situated within the container wherein the heat flux sensor assembly comprises a catalytic sensor element and a reference element, said catalytic sensor element comprising a catalyst coated on the periphery of a temperature sensing device whereby the catalytic sensor element catalytically reduces the NO_x with the NO_x reductant and measures the temperature rise from the reduction.

5,486,337

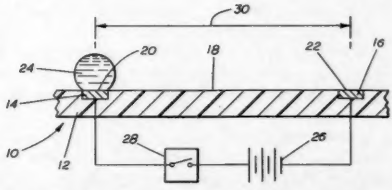
DEVICE FOR ELECTROSTATIC MANIPULATION OF DROPLETS

Tihiro Ohkawa, La Jolla, Calif., assignor to General Atomics, San Diego, Calif.

Filed Feb. 18, 1994, Ser. No. 198,947

Int. Cl.[6] G01N *1/28;1/38*

U.S. Cl. 422—100 **7 Claims**



1. A device for manipulation of liquid droplets,comprising:

a positioning means for establishing an initial position of an individual liquid droplet, said positioning means being electrically conductive;

an attraction means adjacent to said positioning means for electrostatically attracting a droplet from said positioning means; and

a voltage application means for applying a first voltage to said positioning means, thereby electrostatically charging the droplet, then raising said first voltage to a higher magnitude and applying a second voltage of opposite polarity to said attraction means to generate a force urging the droplet from said positioning means toward said attraction means;

wherein:

said positioning means and said attraction means comprise first and second electrodes, respectively;

said first and second electrodes comprise wettable surfaces exposed to the droplet; and

said first and second electrodes are surrounded by a non-wettable surface.

5,486,338

METAL CATALYST CARRIER FOR EXHAUST GAS PURIFICATION

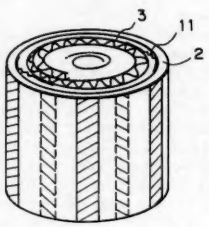
Hitoshi Ota; Masao Yashiro, both of Tokai; Koki Yotsuya, Kimitsu; Takuzo Kako, Kimitsu, and Yuzi Nakashima, Kimitsu, all of, Japan, assignors to Nippon Steel Corporation, Tokyo, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 27, 1993, Ser. No. 126,943

Claims priority, application Japan, Sep. 29, 1992, 4-260389

Int. Cl.[6] F01N *3/10;* **B01D** *53/34*

U.S. Cl. 422—179 **11 Claims**



1. A metal catalyst carrier for exhaust gas purification, comprising:

a columnar metal honeycomb having an inlet end and an outlet end and having a circumferential direction, said honeycomb fabricated by spirally winding a laminate of a flat metal foil and a corrugated metal foil, said columnar metal honeycomb having an axial length of 20 mm or less and having an outer circumferential surface;

a columnar metal case having an inner circumferential surface, and enclosing said columnar metal honeycomb, said inner circumferential surface of said columnar metal case being spaced from said outer circumferential surface of said columnar metal honeycomb thereby forming a circumferential space therebetween;

a cushion member disposed in said circumferential space, said cushion member having alternate joints to said inner circumferential surface of said columnar metal case and said outer circumferential surface of said columnar metal honeycomb at spaced intervals only in the circumferential direction wherein the alternate joints to at least one of said inner circumferential surface of said columnar metal case and said outer circumferential surface of said columnar metal honeycomb axially extend from said inlet end to said outlet end of said honeycomb.

5,486,339

HIGH-PRESSURE MELAMINE REACTOR

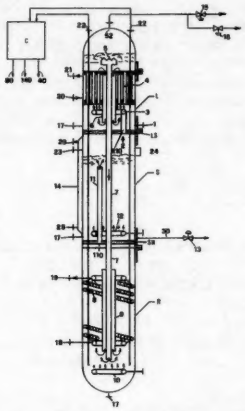
Wladimiro Bizzotto, Via Fontanelle 87/A, 36061 Bassano Del Grappa (VI), Italy

Filed Feb. 16, 1994, Ser. No. 197,175

Claims priority, application Italy, Feb. 22, 1993, VI93A0025

Int. Cl.[6] B01J *10/00*

U.S. Cl. 422—193 **9 Claims**



1. A reactor for the production of melamine comprising:

a single vessel having an outer wall and being divided in a vertically stacked interconnected arrangement of a top sector, a central sector, and a bottom sector;

a pair of upper and lower spaced apart horizontal diaphragms located within the vessel, the upper diaphragm defining a boundary between the top sector and the central sector and the lower diaphragm defining a boundary between the central sector and the bottom sector, said top, bottom and central sectors respectively facilitating washing from raw off-gas produced by the reaction the melamine ammonia and reactants; reacting urea, ammonia and reactants; and separating melamine from ammonia and reactants;

an inlet in the top sector for introducing molten urea therein;

a pressure regulating and extraction tube in the top sector for extracting ammonia and reactants therefrom and adjusting operating pressure of the vessel;

a top heat exchange means located within the top sector, an inlet and an outlet projecting through the outer wall of the vessel in the top sector in communication with the top heat exchange means for circulating a working fluid therethrough to cool raw off-gas which by direct contact heats the molten urea;

bottom heat exchange means located within the bottom sector;

an inlet and an outlet projecting through the outer wall of the vessel in communication with the bottom heat exchange means for circulating a heated working fluid therethrough for heating the molten urea;

a central heat exchange means located in heat exchange relation with the central sector and including an inlet and an outlet for communicating a working fluid therethrough for maintaining the central sector at a selected temperature;

a first tube running through aligned holes in each of the upper and lower diaphragms for feeding molten urea from the top sector to the bottom sector;

a second tube connected at one end through a hole in the lower diaphragm and projecting upwards from the lower diaphragm for feeding reactants from the bottom sector into the central sector;

a third tube connected at one end through a hole in the upper diaphragm and projecting upwards from the upper diaphragm for distributing reactants from the central sector into the top sector;

a first reactant inlet projecting through the outer wall of the vessel in the lower portion of the bottom sector for introducing ammonia;

a second reactant inlet projecting through the outer wall of the vessel in the lower portion of the central sector for introducing ammonia therein;

an outlet tube projecting through the outer wall of the vessel and a lower portion of the central sector for removing melamine therefrom;

a reactant recovery outlet tube projecting through the outer wall of the vessel in the lower portion of each sector for recovering reactants therefrom;

temperature sensing means for sensing the temperature in each of the respective top, central and bottoms sectors; and

means responsive to the temperature sensing means and coupled to the top, central and bottom heat exchange means for regulating the temperature of each sector.

5,486,340

EXHAUST GAS CONDITIONING

James R. Smith, and Peter L. Timms, both of Bristol, United Kingdom, assignors to The BOC Group plc, Windlesham, England

Continuation of Ser. No. 118,324, Sep. 9, 1993, abandoned, which is a continuation of Ser. No. 859,380, May 27, 1992, abandoned. This application Jun. 24, 1994, Ser. No. 267,095

Claims priority, application United Kingdom, Dec. 2, 1989, 8927314

Int. Cl.[6] A62D *3/00;* **B01D** *53/34;* **C01B** *21/083*

U.S. Cl. 423—240 S **10 Claims**

1. A method treating gases including exposing the gases in sequential order to: a first reaction stage comprising a magnesium or calcium material, wherein said magnesium or calcium material is calcium oxide, calcium carbonate, calcium hydroxide, magnesium oxide, magnesium carbonate, magnesium hydroxide or mixtures thereof; and a second reaction stage comprising a silicon material, wherein said silicon material is silicon or silicon alloys.

5,486,341

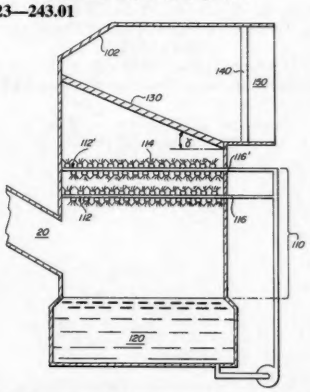
ENTRAINMENT SEPARATOR FOR HIGH VELOCITY GASES

Gerald E. Bresowar, Homewood, Ala., assignor to ABB Environmental Systems, Div. of ABB Flakt, Inc., Birmingham, Ala.

Filed Jun. 9, 1994, Ser. No. 257,085

Int. Cl.[6] B01D *53/50;53/78*

U.S. Cl. 423—243.01 **9 Claims**



1. An improved wet scrubbing process for reducing the concentration of SO_2 in flue gases, comprising:

(a) directing a flow of flue gas upwardly through a scrubbing tower;

(b) introducing a spray of droplets of an aqueous slurry of finely-divided calcium carbonate, calcium sulfate, calcium sulfite, and other non-reactive inerts to contact the flue gas in a vertical scrubbing section, the slurry descending through the tower countercurrently to the flow of flue gas and being collected as a liquid after contact; and

(c) passing the flue gas through a single pass entrainment separator positioned above and across the vertical scrubbing section at an angle within the range of about 10° to about 45 degrees relative to the horizontal effective to reduce or consolidate a substantial quantity of droplets entrained in the gas and to also turn the direction of flow of the flue gas from the vertical said entrainment separator includes individual single-pass separator blades, said individual blades are oriented at an angle within the range of about 35° to about 55 degrees from the vertical.

5,486,342

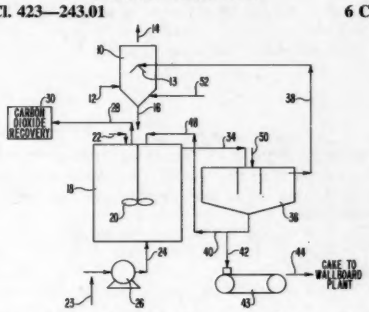
CLEAR LIQUOR SCRUBBING OF SULFUR DIOXIDE WITH FORCED OXIDATION IN FLUE GAS DESULFURIZATION SYSTEM

Robert E. Moser, Palo Alto; David R. Owens, Mountain View, both of Calif.; James H. Wilhelm, Sandy, Utah; Miriam Stohs, Austin, Tex.; James D. Colley, Anchorage, Ky., and Oliver W. Hargrove, Jr., Austin, Tex., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 13, 1994, Ser. No. 258,921

Int. Cl.[6] B01D *53/50*

U.S. Cl. 423—243.01 **6 Claims**



1. A wet flue gas desulfurization process for removing sulfur oxides from flue gas to produce a usable gypsum by-product without producing scale in the process equipment, including the steps of:

(a) injecting an alkali into the flue gas upstream of the particulate removal device and the scrubber in an amount sufficient to absorb chloride from the flue gas;

(b) directing sulfur oxides-containing flue gas through a particulate removal device to remove ash and alkali chlorides and then to a scrubber;

(c) scrubbing the sulfur oxides from the flue gas with a clear scrubbing liquid that is substantially solids free and contains an organic acid buffer system capable of controlling and maintaining the pH of said process at a pH in the range of 4.5 to 6.0 to produce a sulfur-oxides free gas and a sulfur oxides-containing effluent;

(d) discharging the sulfur oxides-free gas from the process;

(e) directing the sulfur oxides-containing scrubber effluent from the scrubber to a reactor system containing lime or limestone, wherein a sufficient supply of oxidation air is constantly supplied to the reactor system to favor the production of calcium sulfate;

(f) reacting the sulfur oxides-containing scrubber effluent with the lime or limestone in the presence of oxidation air in the reaction system to form a gypsum slurry having a gypsum concentration of 10 to 20 wt. %;

(g) directing the gypsum slurry to a clarifier and clarifying a first portion of the gypsum slurry to produce a clear liquor fraction with a gypsum relative saturation of less than 1.2 and gypsum solids;

(h) dewatering the gypsum solids;
(i) thickening a second portion of the gypsum slurry from the clarifier and recirculating the thickened gypsum slurry to the reactor system;
(j) maintaining the gypsum relative saturation at less than 1.2; and
(k) adding an organic acid buffer system to the clear liquor fraction to control and maintain a process pH of 4.5 to 6 and circulating the clear liquor fraction to the scrubber for use in scrubbing sulfur oxides from the flue gas.

5,486,343

LITHIUM AMIDE PROCESS

James A. Schwindeman, Charlotte, and Robert C. Morrison, Gastonia, both of N.C., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 25, 1994, Ser. No. 232,891
Int. Cl.[6] C01B *21/00*
U.S. Cl. 423—413 **7 Claims**

1. A process for the preparation of lithium amide consisting essentially of forming lithium bronze by introducing at least one equivalent of anhydrous ammonia over a 1 to 5 hour period into a reaction mixture containing one equivalent of lithium in a liquid hydrocarbon solvent selected from the group consisting of olefins containing 2 to 16 carbon atoms at a temperature of up to 40° C., thenafter the lithium bronze is formed, heating the reaction mixture to 50° to 80° C. for two to four hours to decompose the lithium bronze and form a suspension of lithium amide in the solvent from which suspension the lithium amide is recovered.

5,486,344

METHOD OF PRODUCING CHLORINE DIOXIDE

John R. Winters, Marietta; John M. Gray, Roswell, and Joel D. Tenney, Atlanta, all of Ga., assignors to Eka Nobel Inc., Marietta, Ga.

Filed Jun. 9, 1992, Ser. No. 895,634
Int. Cl.[6] C01B *11/02*
U.S. Cl. 423—477 **8 Claims**

1. A method for producing chlorine dioxide, comprising the steps of:
(a) feeding chloric acid and hydrogen peroxide as a reducing agent to a reaction medium in the substantial absence of mineral acids other than chloric acid and in the substantial absence of alkali metal ions, and
(b) reducing the chloric acid to chlorine dioxide.

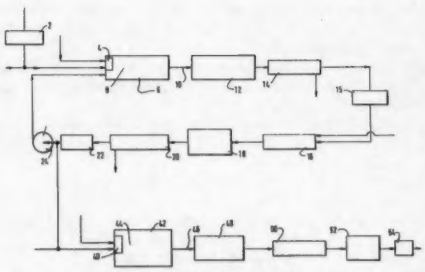
5,486,345

TREATMENT OF GASES

Richard W. Watson, Ilkley, United Kingdom, assignor to The BOC Group plc, Windlesham Surrey, England

Continuation of Ser. No. 834,927, Feb. 12, 1992, abandoned. This application Aug. 19, 1994, Ser. No. 293,410
Claims priority, application United Kingdom, Feb. 19, 1991, 9103382
Int. Cl.[6] B01D *53/50;53/52*
U.S. Cl. 423—573.1 **12 Claims**

1. A method of recovering sulphur from a feed gas comprising hydrogen sulphide, comprising the steps of:
a) carrying out combustion of a part of the hydrogen sulphide content of a feed gas stream in a furnace to form sulphur dioxide and water vapour;
b) supplying oxygen-rich gas to support the combustion of said part of the hydrogen sulphide at a rate such that the volumetric flow rate of oxygen into the furnace is less than half the volumetric flow rate of hydrogen sulphide into the furnace, the oxygen-rich gas supporting combustion of said part of the hydrogen sulphide;



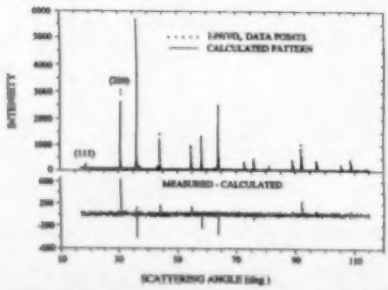
c) allowing remaining hydrogen sulphide in the feed gas stream to react in the furnace with said sulphur dioxide thereby producing sulphur vapour and water vapour;
d) withdrawing a stream of gas -mixture comprising hydrogen sulphide, sulphur dioxide, sulphur vapour and water vapour from the furnace and separating sulphur vapour therefrom to form a partially converted gas stream;
e) dividing the partially converted gas stream into first and second subsidiary partially converted gas streams;
reacting with oxygen-rich gas at least part of the first subsidiary partially converted gas stream so that all of said hydrogen sulfide of said at least part of the first subsidiary partially converted gas stream is fully oxidized to sulphur dioxide and water vapour and thereby forms a hydrogen sulphide-free gas stream;
g) separating water vapour from the hydrogen sulphide-free gas stream to form a recycle gas stream;
h) returning to the furnace at least part of the recycle gas stream and reacting in the furnace sulphur dioxide in the said part of the recycle stream with hydrogen sulphide in the feed gas so as to enhance the sulphur formation in the furnace;
i) subjecting the second subsidiary partially converted gas stream to at least one further stage of reaction between its hydrogen sulphide content so as to form further sulphur vapour;
j) extracting said further sulphur vapour from the second subsidiary partially converted gas stream; and
k) discharging the second subsidiary partially converted gas downstream of the said at least one further stage of reaction.

5,486,346

SYNTHESIS OF CATHODE MATERIAL SUCH AS $LiNiVO_4$ AND $LiCoVO_4$ FOR LITHIUM SECONDARY BATTERIES

George T. Fey, Chung Li City, Taiwan, Prov. of China, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed May 13, 1994, Ser. No. 243,393
Int. Cl.[6] C01G *51/00;53/00;* **H01M** *4/58;4/52*
U.S. Cl. 423—594 **11 Claims**



1. A method for preparing cathode material for use in lithium secondary batteries comprising the steps of:

(a) mixing first and second reactants, in a molar ratio of about 2 to 1, to form a reaction mixture, said first reactant being represented by Li_xMO_2, wherein M is either Ni or Co, and x is a variable form 0.25 to 1.1, and said second reactant being selected from the group consisting of V_2O_3, V_2O_5, and NH_4VO_3; and

(b) sintering said reaction mixture in air at temperatures between 650° C. and 700° C. for 1 to 2 hours to obtain an inverse spinel $LiMVO_4$ for use as a cathode material.

5,486,347

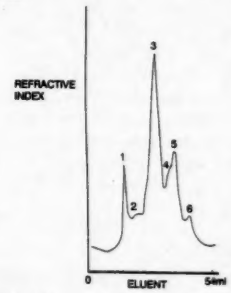
ANTIPERSPIRANT COMPOSITION

David T. Callaghan, Quincy; Alan M. Phipps, Framingham, both of Mass., and Stephen J. Provancal, Addison, Ill., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 252,376, Jun. 1, 1994, which is a continuation of Ser. No. 846,016, Mar. 4, 1992, abandoned, which is a division of Ser. No. 287,096, Dec. 20, 1988, Pat. No. 5,114,705, which is a continuation of Ser. No. 713,470, Mar. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 523,785, Aug. 16, 1983, abandoned. This application May 25, 1995, Ser. No. 452,554

Int. Cl.[6] A61K *7/34;7/38;* **C07F** *9/00;* **C01G** *9/02*

U.S. Cl. 423—623 **16 Claims**



1. A method of making a high efficacy antiperspirant salt which comprises providing an aqueous solution of enhanced efficacy aluminum chlorhydroxide, adding zirconyl hydroxy chloride to said solution to provide a mixed solution, said zirconyl hydroxy chloride being added in an amount to provide an atomic ratio of Al:Zr of about 1:1 to 6:1, and rapidly drying said mixed solution to solid form.

5,486,348

ZEOLITE L PREPARATION

Johannes P. Verduijn, Spijkenisse, and Pieter E. Gellings, Oostvoorne, both of, Netherlands, assignors to Exxon Research & Engineering (ER&E), Linden, N.J.

Continuation of Ser. No. 121,972, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 492,249, Mar. 9, 1990, abandoned, which is a continuation of Ser. No. 160,366, Feb. 25, 1988, abandoned. This application Oct. 12, 1994, Ser. No. 320,972

Claims priority, application United Kingdom, Feb. 25, 1987, 87-04365

Int. Cl.[6] C01B *39/32*

U.S. Cl. 423—700 **11 Claims**

1. A method of preparing binderless zeolite L particles, in which particles are first formed from a mixture of silica and from 10 to 95% preformed zeolite L crystallites, and said particles are thereafter reacted with an aqueous alkaline solution containing a source of alumina sufficient to convert the silica binder to zeolite L, in which the combined composition of the alkaline solution and the silica in the initial particles is such that the molar ratio of SiO_2 to Al_2O_3 is in the range of 4–15.

5,486,349

AROMATIC AMIDE POLYAZA MACROCYCLIC COMPOUNDS AND METAL CHELATES THEREOF

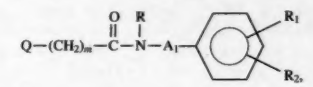
Ramachandran S. Ranganathan, Princeton; Edmund R. Marinelli, Lawrenceville; Radhakrishna Pillai, Kendall Park, and Michael F. Tweedle, Princeton, all of N.J., assignors to Bracco International B.V., Amsterdam, Netherlands

Filed Apr. 8, 1994, Ser. No. 225,210

Int. Cl.[6] A61B *5/055*

U.S. Cl. 424—9.363 **16 Claims**

1. A compound of the following formula I:



I

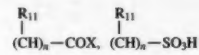
wherein

Q is a polyaza macrocyclic group containing at least one aminocarboxylate, aminophosphonate and/or aminohydroxamate chelating group;

A_1 is $(CH_2)_m'$, $(CH_2)_n—O—(CH_2)_n'$ or a single bond;

$(CH_2)_m$ and $(CH_2)_m'$ may be independently substituted with alkyl or hydroxyalkyl;

R is

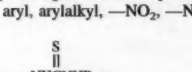


or $—[(CH_2)_2—Y]—R_{13}$;

X is —OH, —O—alkyl or $—NHR_{12}$;

Y is —O— or —NH—;

R_1 and R_2 are each independently hydrogen, alkyl, cycloalkyl, aryl, arylalkyl, $—NO_2$, $—NH_2$,



—NCS,

—COOH, $—N—N^+{\equiv}N^-$, $—NR_3COR_9$, haloalkyl, C_{1-8} alkoxy, aryloxy, cycloalkyloxy, or a functional group capable of forming a conjugate with a biomolecule or of forming a multimer of said compound of the formula I, or R_1 and R_2 together with the phenyl ring to which they are bonded form a naphthyl group, with the proviso that at least one of R_1 or R_2 must be other than hydrogen;

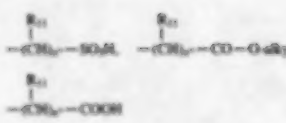
R_3 and R_4 are independently hydrogen, alkyl, arylalkyl, aryl, alkoxy or hydroxyalkyl, or R_3 and R_4, together with the nitrogen atom to which they are bonded, form a maleimide group;

R_9 is alkyl or hydroxyalkyl;

each R_{11} is independently hydrogen or alkyl;

R_{13} is $—CH_2COOH$ or $—CH_2CONHR_{12}$;

R_{12} is hydrogen, alkyl, $—NH_2$,



or hydroxyalkyl;

m, m', n, n' and n'' are independently 1 to 5;

or a salt and/or a multimeric form thereof.

5,486,350

DESENSITIZING ANTI-TARTAR DENTIFRICE

James Northeet, Plainfield; Willie J. Carter, Belle Mead; Matthew J. Frankel, Franklin Park, and Abdul Gaffar, Princeton, all of N.J., assignors to Colgate Palmolive Company, Piscataway, N.J.

Division of Ser. No. 71,384, Jun. 4, 1993, Pat. No. 5,352,439, which is a continuation of Ser. No. 778,532, Oct. 17, 1991, Pat. No. 5,340,697. This application Jan. 6, 1994, Ser. No. 254,718

Int. Cl.[5] A61K *7/16; 7/18*

U.S. Cl. 424—49 **7 Claims**

1. A desensitizing anti-tartar oral composition which consists essentially of an orally acceptable vehicle or base for such composition, an effective anti-tartar proportion of anti-tartar or anti-calculus phosphono compound or a mixture thereof;

a desensitizing proportion of a tooth pain inhibiting potassium salt which passes through exposed dentin tubules to tooth nerves or neurons, which tooth pain inhibiting potassium salt is potassium nitrate, potassium citrate, potassium oxalate or a mixture of two or more thereof; and

wherein there is present in said toothpaste, from said anti-tartar agent or from an additional material, a source of potassium ions in addition to the tooth pain inhibiting potassium salt, the oral composition having a potassium content, in addition to the potassium pain inhibitor, in the range of 0.2 to 5% by weight, such potassium being in ionizable form.

5,486,351

METHOD FOR MAKING STABLE, EXTRACELLULAR TYROSINASE AND SYNTHESIS OF POLYPHENOLIC POLYMERS THEREFROM

Guy R. della-Cioppa; Stephen J. Garger, Jr.; Richard B. Holtz; Michael J. McCulloch, and Gennadie G. Sverlow, all of Vacaville, Calif., assignors to Biosource Technologies, Inc., Vacaville, Calif.

Division of Ser. No. 982,095, Nov. 25, 1992, Pat. No. 5,340,734. This application Dec. 14, 1993, Ser. No. 166,465

Int. Cl.[5] A61K *7/42;* **C12P** *21/06;* **C12N** *1/20;15/00*

U.S. Cl. 424—59 **8 Claims**

1. A PPP produced by an in vitro method of producing polyphenolic polymers ("PPP") comprising the steps of taking extracellular tyrosinase, produced by a microorganism selected from the group consisting of Streptomyces, Escherichia, Bacillus, Streptococcus, Salmonella, Staphylococcus, and Vibrio, wherein said microorganism contains an expression vector with polynucleotides encoding tyrosinase, and contacting said tyrosinase with tyrosinase substrates wherein at least one tyrosinase substrate is selected from the group consisting of X/L-tyrosine, L-tyrosine/X, and X/L-tyrosine/X, where X is selected from the group consisting of a single amino acid, a dipeptide, and an oligopeptide bound to L-tyrosine, under suitable reaction conditions, to form PPP and recovering the PPP so produced.

5,486,352

SUNSCREEN COMPOSITIONS

Angel A. Guerrero, Huntington, Conn., assignor to Elizabeth Arden Company, New York, N.Y.

Filed Jan. 3, 1995, Ser. No. 367,650

Int. Cl.[6] A61K *7/42*

U.S. Cl. 424—59 **6 Claims**

1. A sunscreen composition comprising:

(i) from about 1 to about 90% by weight of water;

(ii) from about 1 to about 90% by weight of an emollient oil;

(iii) from about 0.1 to about 30% by weight of an organic sunscreen agent with a chromophoric group active within the ultraviolet radiation range from 290 to 400 nm; and

(iv) from about 0.1 to about 50% by weight of a microfluidized medium comprising:

from about 1 to about 80% by weight of water;

from about 0.001 to about 5% by weight of a phospholipid;

from about 1 to about 50% by weight of an organic sunscreen agent identical to that of component (iii), and the medium being formulated and microfluidized prior to blending with components (i) to (iii).

5,486,353

ANTISUN PRODUCT

Mario Billia, Münchwilen, and Sigrun Siladji, Ettenhausen, both of, Switzerland, assignors to Solco Basel AG, Basel, and Greiter AG, Altstätten, both of, Switzerland

Filed Sep. 27, 1994, Ser. No. 313,001

Claims priority, application Switzerland, Sep. 29, 1993, 2929/93

Int. Cl.[6] A61K *7/42*

U.S. Cl. 424—59 **9 Claims**

1. An antisun product consisting essentially of an effective amount of a deproteinated haemodialysate of mammalian blood or an active fraction thereof, one or more substances which act as sunscreen agents and/or sun blocks in an amount effective to achieve a sun protection factor of 2 to 25, and cosmetic auxiliaries conventionally added to antisun products.

5,486,354

COSMETIC MAKE-UP COMPOSITION CONTAINING A TRANSPARENT TITANIUM OXIDE AND SILICON OXIDE PIGMENT

Béatrice Defosser, and Sylvie Rossignol, both of Paris, France, assignors to L'Oreal, Paris, France

PCT No. PCT/FR93/00099, § 371 Date Sep. 29, 1993, § 102(e) Date Sep. 29, 1993, PCT Pub. No. WO93/14739, PCT Pub. Date Apr. 5, 1993

PCT Filed Jan. 29, 1993, Ser. No. 122,469

Claims priority, application France, Jan. 31, 1992, 92 01086

Int. Cl.[6] A61K *7/021;7/00*

U.S. Cl. 424—63 **11 Claims**

1. A cosmetic make-up composition comprising, in a cosmetic carrier, 0.5 to 30 percent by weight, relative to the total weight of said composition, of a transparent pigment comprising at least 60 percent by weight of titanium oxide in lamellar form and at most 10 percent by weight of silicon oxide, said transparent pigment having a mean size ranging from 1 to 300 μm and a thickness ranging from 0.001 to 0.3 μm.

5,486,355
HOMOGENEOUS COSMETIC STICK PRODUCTS

John R. Berschied, Jr., Lawrenceville, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Filed Dec. 8, 1992, Ser. No. 986,810
The portion of the term of this patent subsequent to Oct. 19, 2010, has been disclaimed.
Int. Cl.[6] A61K 7/32
U.S. Cl. 424—65 26 Claims

1. An antiperspirant-deodorant cosmetic stick product consisting of a solid organic matrix comprising the following parts by weight of ingredients:

volatile silicone oil	10–50
liquid emollient	1–30
low melting point wax	12–24

and the solid organic matrix has homogeneously dispersed therein between about 18–35 parts by weight of particulate antiperspirant and between about 0.05–30 parts by weight water-soluble inorganic salt deodorant ingredients; wherein the dispersed particles have a density which is less than about one gram per cubic centimeter higher than the density of the solid organic matrix.

5,486,356
DEODORANT COMPOSITION COMBINING TRANSITION METAL OXIDE OR ALLOY WITH CATALYTIC METAL ON CARRIER

Seung-jae Yim, Seoul, Rep. of Korea, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 889,139, May 27, 1992, abandoned.
This application Jul. 21, 1993, Ser. No. 94,383
Claims priority, application Rep. of Korea, May 30, 1991, 91-8881
Int. Cl.[6] A01N 25/12
U.S. Cl. 424—76.1 4 Claims

1. A deodorant consisting essentially of:

(1) a carrier formed of (a) 70–94 percent by weight of silica gel, MgO, and talc; and (b) 6–30 percent by weight of transition metal oxide or alloy; and

(2) a catalytic metal adsorbed on said carrier in an amount of 0.2–1 percent by weight based on weight of said carrier,

wherein said carrier comprises a porous carrier containing 20–50 percent by weight of silica gel, 20–40 percent by weight of MgO, 20–40 percent by weight of talc, and 6–30 percent by weight of transition metal oxide or alloy, and

wherein said catalytic metal has a covalent bond strength with oxygen which is weaker than its covalent bond strength with sulfur.

5,486,357
RADIOFREQUENCY PLASMA BIOCOMPATIBILITY TREATMENT OF INSIDE SURFACES

Pallassana V. Narayanan, Davie, Fla., assignor to Cordis Corporation, Fla.

Continuation of Ser. No. 4,998, Jan. 15, 1993, abandoned, which is a continuation of Ser. No. 720,410, Jun. 25, 1991, Pat. No. 5,244,654, which is a continuation-in-part of Ser. No. 610,548, Nov. 8, 1990, Pat. No. 5,132,108. This application Oct. 27, 1993, Ser. No. 143,994
The portion of the term of this patent subsequent to Sep. 14, 2010, has been disclaimed.
Int. Cl.[6] A61L 33/00;29/00; A61K 31/725;35/62; B05D 3/06
U.S. Cl. 424—78.17 15 Claims

1. A method for enhancing the biocompatibility of interior polymeric surfaces of medical device components, comprising the steps of:

positioning a medical device component within a radiofrequency plasma discharge apparatus, the medical device component being catheter tubing with a polymeric surface interior lumen having a diameter of less than about 0.1 inch, said catheter tubing having a length suitable for use as a catheter in humans;

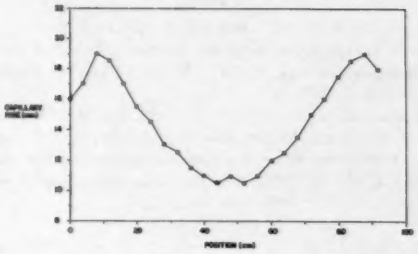
providing a reduced pressure environment within the radiofrequency plasma discharge apparatus, said reduced pressure environment being about 0.25 Torr or less;

inserting into said reduced pressure environment a plasma medium selected from the group consisting of water vapor, oxygen gas, and mixtures thereof, said plasma medium having a pressure of less than about 0.2 Torr;

subjecting said plasma medium to a radiofrequency electric field to induce a gas discharge in order to form reactive species from said plasma medium within the plasma discharge apparatus and within the lumen to form a modified interior polymeric lumen surface comprising reactive sites which had been modified by the subjecting step, said subjecting step being carried out for at least about 10 minutes and while said plasma medium has a pressure of less than about 0.2 Torr;

treating said modified interior polymeric lumen surface with a spacer component having amine groups whereby covalent linkages are formed between the spacer component amine groups and the reactive sites of the modified interior polymeric lumen surface to form a spacer component-treated modified polymeric lumen surface; and

covalently bonding an anti-thrombogenic, fibrinolytic or thrombolytic agent having acid functionality and biologically active properties to said spacer component-treated modified polymeric lumen surface, whereby said modified polymeric lumen surface is rendered into a biocompatible surface, and the anti-thrombogenic, fibrinolytic or thrombolytic agent of the biocompatible surface is resistant to extraction under in vivo conditions while retaining its biologically active properties.



5,486,358
AZLACTONE-FUNCTIONAL POLYMER BLENDS, ARTICLES PRODUCED THEREFROM AND METHODS FOR PREPARING BOTH

Patrick L. Coleman, Minneapolis; Steven M. Heilmann, Afton; Steven L. Kangas, Woodbury; Jerald K. Rasmussen, May Township, Washington County; Richard J. Rolando, Oakdale, and Julie B. Stahl, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 119,036, Sep. 9, 1993, Pat. No. 5,408,002.
This application Apr. 3, 1995, Ser. No. 415,730
Int. Cl.[6] C08L 39/04; A61K 47/32; B32B 27/30
U.S. Cl. 424—78.23 5 Claims

1. A molded article, comprising:

a thermoplastic composition molded into the article by a molding technique wherein the thermoplastic composition comprises a blend of an azlactone-functional homopolymer and a thermoplastic polymer, wherein azlactone-functional surfaces of the molded article have azlactone-reactive ligands coupled thereto.

5,486,359

HUMAN MESENCHYMAL STEM CELLS

Arnold I. Caplan, and Stephen E. Haynesworth, both of Cleveland Heights, Ohio, assignors to Osiris Therapeutics, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 615,430, Nov. 16, 1990, abandoned, and a continuation-in-part of Ser. No. 716,917, Jun. 18, 1991, abandoned, and a continuation-in-part of Ser. No. 34,272, Mar. 22, 1993, abandoned. This application Feb. 8, 1994, Ser. No. 193,262

Int. Cl.[6] A61K *35/12;* C12N *5/00;5/08*

U.S. Cl. 424—93.7 38 Claims

1. An isolated, homogeneous population of human mesenchymal stem cells which can differentiate into cells of more than one connective tissue type.

5,486,360

METHOD OF TREATING TUMOUR CELLS USING CATALASE

Robert H. Ballagh, 125 Bell Farm Rd. Suite 203, Barrie, Ontario, Canada, and Jeff B. Jones, 217 Pembroke Street East, Pembroke, Ontario, Canada, assignors to St. Joseph Health Centre; The Lawson Research Institute, both of London; Robert H. Ballagh, Barrie, and Jeff B. Jones, Pembroke, all of, Canada

Filed Apr. 22, 1993, Ser. No. 50,776

Int. Cl.[6] A61K *38/44*

U.S. Cl. 424—94.4 7 Claims

1. A method of selectively radiosensitizing fibrosarcoma cells during radiotherapy in a mammal which comprises administering to a mammal having a radiation sensitive fibrosarcoma an antioxidant in an amount effective for selectively sensitizing the fibrosarcoma cells to radiation injury, wherein the antioxidant is catalase.

5,486,361

HYBRIDOMAS AND MONOCLONAL ANTIBODIES THAT SPEIFICALLY BIND TO GPIB ON PLATELETS AND INHIBIT THE BINDING OF THROMBIN TO PLATELETS

Harvey R. Gralnick, Kensington, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 25, 1993, Ser. No. 140,412

Int. Cl.[6] A61K *39/395;* C07K *16/28;* C12N *5/20*

U.S. Cl. 424—144.1 9 Claims

1. A monoclonal antibody having the characteristics of:

i) binds to glycoprotein Ibα

ii) inhibits thrombin binding to platelets at nanomolar concentrations of thrombin;

iii) completely inhibits thrombin-induced platelet aggregation;

iv) completely inhibits the high affinity binding of thrombin to GPIb; and

v) inhibits 50–70% of the moderate affinity thrombin binding sites on platelets.

5,486,362

CONTROLLED, SUSTAINED RELEASE DELIVERY SYSTEM FOR TREATING DRUG DEPENDENCY

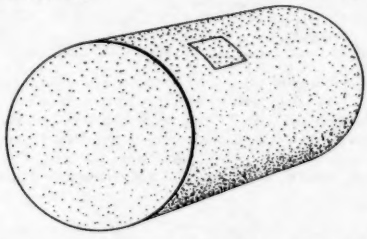
Judith P. Kitchell, Newton; Indu A. Muni, N. Reading, and Yvonne N. Boyer, Salem, all of Mass., assignors to DynaGen, Inc., Cambridge, Mass.

Continuation of Ser. No. 880,959, May 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 696,637, May 7, 1991, abandoned. This application Oct. 21, 1993, Ser. No. 140,280

The portion of the term of this patent subsequent to Apr. 4, 2012, has been disclaimed.

Int. Cl.[6] A61F *2/02;* A61K *9/70;9/48;9/50*

U.S. Cl. 424—426 15 Claims



1. A method of treating an individual for a drug dependence comprising, administering at least one physical constraint modulation system to said individual, said physical constraint modulation system releasing an amount of a drug substitute effective to diminish the individual's desire for a drug of abuse for a period of time having a duration of at least one day.

5,486,363

PREPARATION OF CHOLINE CHLORIDE-CONTAINING POWDERS, THESE POWDERS, AND THEIR USE

Hans Kiefer, Neustadt; Roland Betz, Niederkirchen, and Wolfgang Bewert, Frankenthal, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 67,810, May 27, 1993, abandoned. This application Nov. 16, 1994, Ser. No. 342,026

Claims priority, application Germany, Jun. 6, 1992, 42 18 768.0

Int. Cl.[6] A23K *1/165*

U.S. Cl. 424—442 5 Claims

1. A process for preparing dry, free-flowing, choline chloride-containing powders which comprises: atomizing a colloid-free aqueous choline chloride solution in a countercurrent-flowing air stream that contains a hydrophobic spraying auxiliary powder finely dispersed in the air stream in an amount such that the sprayed choline chloride droplets are coated with 2 to 25% by weight of spraying auxiliary powder, based on choline chloride calculated as 100%, said hydrophobic spraying auxiliary being a silanized silicic acid or a salt of a medium to relatively long chain fatty acid, and thereafter drying the coated droplets to form a free-flowing choline chloride-containing powder.

5,486,364

READILY AVAILABLE KONJAC GLUCOMANNAN AS A SUSTAINED RELEASE EXCIPIENT

Victor L. King, Ewing, N.J.; Thomas A. Wheatley, Richboro, Pa., and David F. Erkoboni, Lawrenceville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 998,335, Dec. 30, 1992, abandoned. This application Aug. 15, 1994, Ser. No. 290,457

Int. Cl.[6] A61K *9/22;9/10;47/36*

U.S. Cl. 424—488 24 Claims

1. A solid dosage form, comprising an active ingredient and a sustained release excipient which excipient is at least 7 weight

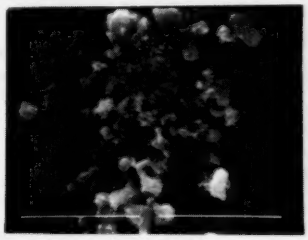
percent of a readily available konjac glucomannan based on the weight of the solid dosage form, wherein the dosage form contains no gas producing disintegrant.

5,486,365

CALCIUM HYDROGEN PHOSPHATE, A METHOD FOR PREPARING IT, AND AN EXCIPIENT UTILIZING IT

Kanemasa Takado, Takaoka, and Tatsuo Murakami, Kamiichi, both of, Japan, assignors to Fuji Chemical Industry Co., Ltd., Japan

Filed Jul. 8, 1994, Ser. No. 272,043
Claims priority, application Japan, Sep. 17, 1993, 5-254741
Int. Cl.[6] A61K *33/42;* **C01B** *25/32*
U.S. Cl. 424—602 **8 Claims**



1. A scale-like calcium hydrogen phosphate with a specific surface area of 20 m^2/g to 60 m^2/g, an apparent specific volume of 5 ml/g or more, an oil absorption rate of 1.5 ml/g or more, a primary particle size of 0.1μ to 5μ, and an average particle size of 2μ to 10μ among secondary particles that are aggregates of the primary particles, the scale-like calcium hydrogen phosphate being represented by the following general formula:

$$CaHPO_4.mH_2O$$

wherein m satisfies the relationship $0 \leqq m \leqq 0.5$.

6. A method for preparing a scale-like calcium hydrogen phosphate having a calcium to phosphate ratio of exactly 1.0 by reacting either phosphoric acid with an alkaline calcium compound or an alkali metal phosphate with a calcium compound in an aqueous medium in the presence of a multivalent organic acid selected from the group consisting of citric acid, tartaric acid, ethylenediaminetetraacetic acid (EDTA), malic acid and succinic acid with the coordinating ability in order to obtain a columnar calcium hydrogen phosphate, and then subjecting the obtained columnar calcium hydrogen phosphate to hydrothermal treatment at a temperature of 60° C. or higher to obtain said scale-like calcium hydrogen phosphate.

5,486,366

CONTINUOUS CHEWING GUM BASE MANUFACTURING PROCESS USING A MIXING-RESTRICTION ELEMENT

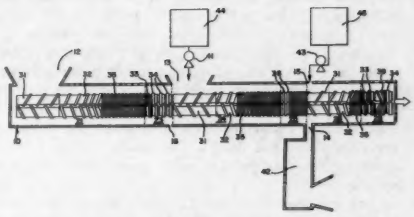
Joo H. Song, Northbrook, and Donald J. Townsend, Chicago, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation-in-part of Ser. No. 126,319, Sep. 24, 1993. This application Oct. 14, 1993, Ser. No. 136,589
Int. Cl.[6] A23G *3/30*
U.S. Cl. 426—5 **23 Claims**

1. A process for continuously producing a chewing gum base comprising the steps of:

a) continuously adding chewing gum base ingredients, including an elastomer, a filler and a plasticizer, into a continuous mixer;

b) subjecting the elastomer, the filler and the plasticizer to a highly distributive mixing operation within said mixer,



c) passing the highly distributively mixed elastomer, filler and plasticizer through a mixing-restriction element within said mixer, thereby producing a chewing gum base; and

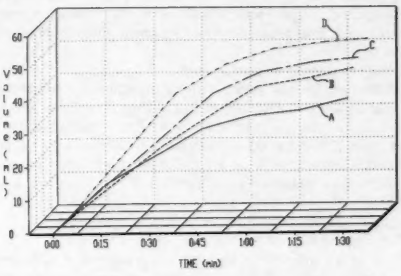
d) continuously discharging the chewing gum base from the mixer while chewing gum base ingredients continue to be introduced and mixed within the mixer.

5,486,367

ENZYMATIC METHOD FOR ACCELERATING FERMENTATION OF COMESTIBLE PRODUCTS

Daniel Y. C. Fung, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.

Continuation of Ser. No. 959,744, Oct. 13, 1992, abandoned. This application Apr. 19, 1994, Ser. No. 230,430
Int. Cl.[6] A23B *4/20;* **A23L** *1/105;* **A21D** *2/00*
U.S. Cl. 426—7 **10 Claims**



1. In a process for the fermentation of a food ingredient substrate to produce a comestible product, including the steps of inoculating said food ingredient substrate with a fermentative microorganism, and incubating the inoculated food ingredient substrate to cause said microorganism to undergo fermentative activity in the presence of the food ingredient substrate to yield said product, the improvement which comprises the step of contacting said food ingredient substrate with an oxygen-reactive enzyme which is not naturally generated by virtue of said fermentation process, for significantly increasing the fermentative activity of said microorganism, as compared with an otherwise identical process free of said added enzyme.

5,486,368

PRODUCTION OF A CULTURED YEAST PRODUCT FROM WHEY PERMEATE, YEAST CREAM AND YEAST CENTRATE

Rudolf de Boer, Wageningen, Netherlands; Roland K. Kramer, Onalaska, and Ronald W. McKernan, Whitehall, both of Wis., assignors to DMV USA, Inc., La Crosse, Wis.

Filed May 28, 1992, Ser. No. 890,513
Int. Cl.[6] A23C *21/00;* **A23L** *1/28;* **C12N** *1/16;* **A23J** *1/18*
U.S. Cl. 426—41 **5 Claims**

1. A process for producing a modified cultured yeast product from a whey permeate comprising:

a. heat treating a whey permeate at a temperature between about 162° F. (72° C.) and 185° F. (85° C.) for a time sufficient to inactivate undesirable microorganisms in the permeate;
b. inoculating the heat-treated whey permeate with a yeast culture in a bioreactor and maintaining the inoculated whey permeate in the bioreactor under yeast growth conditions until a yeast product is produced in the whey permeate, wherein the yeast culture is selected from the group consisting of *Kluveromyces marxianus* and *Candida intermedia;*
c. separating the yeast product into a yeast cream and a yeast centrate;
d. combining the yeast cream and the yeast centrate in quantities such that the ratio of total solids of the yeast cream to the total solids of the yeast centrate is between approximately 0.3 and 1.6;
e. autolyzing the combination of step d. under sufficient conditions to produce an edible modified yeast product; and
f. heating the yeast product under sufficient conditions to inactivate undesirable microorganisms to produce the modified cultured yeast product.

5,486,369

PROCESS FOR PREPARING SHELF-STABLE, INTERMEDIATE-MOISTURE POTATOES

Charles R. Mason, Yonkers; Dalip K. Nayyar, Washingtonville, both of N.Y., and Edward C. Coleman, New Fairfield, Conn., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Jan. 20, 1995, Ser. No. 376,311
Int. Cl.[6] A23L *1/217*
U.S. Cl. 426—321 **4 Claims**

1. A method for producing shelf-stable, intermediate-moisture, fried potatoes suitable for microwave reconstitution comprising the steps of:
(a) preparing strips of raw potatoes;
(b) blanching the raw potato strips in an infusion solution for at least 1 minute at a temperature of at least 200° F., the infusion solution containing at least 5% by weight sodium chloride and at least 12% by weight sugar and a weight ratio of sugar to sodium chloride of from 1:1 to 5:1, the blanching time being effective to infuse sodium chloride and sugar into said potato strips;
(c) draining and cooking the infused potato strips;
(d) drying the infused potato strips; thereafter,
(e) frying the strips for a time and at a temperature sufficient to produce shelf stable, intermediate-moisture potato strips which have a water activity below 0.85 and a moisture content between 10 to 40% by weight and which are to be reconstituted by heating in a microwave oven;
(f) packaging the fried strips in moisture-impermeable packaging material; and
(g) storing the packaged, intermediate-moisture potato strips without refrigeration or sterilization.

5,486,370

METHOD OF CONTINUOUSLY FILTERING COOKING OIL

Thomas H. Bivens, P.O. Box 1250, Magnolia, Tex. 77355

Division of Ser. No. 187,115, Jan. 26, 1994, Pat. No. 5,404,799, which is a continuation of Ser. No. 947,479, Sep. 21, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 356,146
Int. Cl.[6] C11B *5/00*
U.S. Cl. 426—417 **5 Claims**

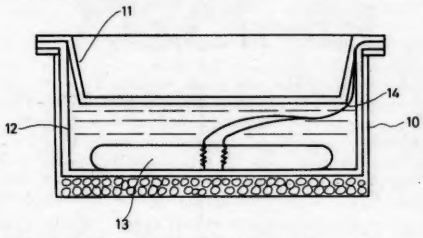
1. A method of continuously filtering cooking oil while frying a food wherein the cooking oil is contained within a tank comprising the steps of:
positioning a filter plate within said tank in a region below a heating source, said filter plate comprising at least one mesh screen operatively connected to piping means, supported on an upper position of said piping means extending through a bottom of said tank;
filtering said cooking oil through said filter plate;
heating said cooking oil to a desired temperature using said heating source;
pumping said cooking oil through said at least one mesh screen, through piping operatively connected to said piping means located exterior of said tank, and returning said cooking oil into said tank at a level below the surface of said cooking oil and above said heating source;
directing a flow of said returning cooking oil downward toward said bottom of said tank;
said pumping step continually performed during a first period to circulate said cooking oil until an aggregation of particulate matter accumulates on an outer surface of said at least one mesh screen, and continually pumping said cooking oil thereafter during a second period while frying the food product.

5,486,371

METHOD FOR COOKING FOOD WITH HEAT ENERGY GENERATED FROM NATURAL STONE MATERIALS

Chung-Te Chen, 58, Ma Yuan West St., Taichung, Taiwan, Prov. of China

Filed Sep. 26, 1994, Ser. No. 311,949
Int. Cl.[6] A23L *1/00;* **F24J** *1/00*
U.S. Cl. 426—510 **4 Claims**



1. A method for utilizing heat energy generated from natural materials for cooking food, said method comprising:
preparing a first stone material including at least 55.5% of calcium oxide;
mixing said first stone material with sodium chloride and calcium chloride to form a first mixture, heating said first mixture from about 20° C. to about 1100° C. to form a slow heating material;
preparing a second stone material including at least 55.5% of calcium oxide;
mixing said second stone material with sodium chloride and calcium chloride to form a second mixture, heating said second mixture from about 200° C. to about 1300° C. to form a fast heating material;
mixing about 80% of said slow heating material and about 20% of said fast heating material to form a final heating material;
placing said final heating material in a first container;
mixing said final heating material with a predetermined amount of water sufficient to generate steam in said first container; and
placing food in a second container in or on said first container and cooking said food with the steam.

5,486,372

FROZEN DAIRY PRODUCT CONTAINING POLYOL POLYESTERS

Robert W. Martin, New Town Square, Pa.; Mark S. Miller, Arlington Heights, and Kevin J. Surber, Lombard, both of Ill., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Mar. 8, 1994, Ser. No. 207,395
Int. Cl.[6] A23G *9/04*
U.S. Cl. 426—565 **20 Claims**

1. A process for preparing a frozen dessert product comprising:

(a) forming a mixture of from about 3% to about 20% polyol fatty acid polyesters having at least 4 fatty acid ester groups, from 0 to about 10% of triglyceride fat, from about 10% to about 19% of non-fat milk solids, from 0 to about 15% of corn syrup solids, from about 6% to about 15% of a carbohydrate sweetener, from 0 to about 0.7% of a stabilizer, from about 0.003% to about 0.007% of an emulsifier and from about 50% to about 75% water;

(b) subjecting said mixture to homogenization at a pressure of at least about 5,000 psig; and

(c) freezing said homogenized mixture with aeration to provide a frozen dessert product.

5,486,373

FROZEN CONFECTION

Christopher B. Holt, Bedford, and Julia H. Telford, Thrapston, both of, United Kingdom, assignors to Good Humor Corporation, Green Bay, Wis.

Continuation of Ser. No. 282,102, Jul. 28, 1994, abandoned, which is a continuation of Ser. No. 51,493, Apr. 22, 1993, abandoned. This application Apr. 19, 1995, Ser. No. 424,766

Claims priority, application European Pat. Off., Apr. 24, 1992, 92303684.2

Int. Cl.[6] A23G *9/00*

U.S. Cl. 426—565 **4 Claims**

1. Frozen gas-containing dessert or confection product comprising a thermal transition temperature in excess of −18° C. and particularly in excess of −13° C., and a bulk density below 0.45 g/ml down to 0.09 g/ml.

5,486,374

MEAT EMULSON PRODUCT

Craig D. Fischer, deceased, late of Manalapan; Dennis J. Breitbart, Kendall Park; Arnold I. Epstein, Cliffside Park, and Dale D. Zabel, Basking Ridge, all of N.J., assignors to Thomas J. Lipton Co., Division of Conopco, Inc., Englewood Cliffs, N.J.

Division of Ser. No. 159,989, Nov. 30, 1993, Pat. No. 5,409,730. This application Oct. 25, 1994, Ser. No. 329,551

Int. Cl.[6] A23L *1/317*

U.S. Cl. 426—574 **16 Claims**

1. A ground or chopped meat product comprising:

(i) a continuous phase of heat settable meat protein;

(ii) a discontinuous phase dispersed in said continuous phase, said discontinuous phase having been dispersed in said continuous phase at a temperature of 10° F. to 30° F., comprising particles of a hardened water-in-oil emulsion having:

(a) a continuous phase of edible fat; and

(b) a discontinuous phase of an aqueous gelled solution, said solution having dissolved or dispersed therein a flavoring agent, whereby said flavoring agent is delivered directly to the taste receptors on the tongue during mastication to enhance the flavor perception of said agent.

5,486,375

CASEINATE REPLACEMENT COMPOSITION FOR IMITATION CHEESE AND PROCESS FOR MAKING IMITATION CHEESE

David Yoder, Crown Point, Ind.; Shau-Gan Chang, Chicago, Ill.; Ansui Xu, Griffith, Ind., and Thomas Domoras, Commerce, Ga., assignors to American Maize Technology, Inc., Dimmitt, Tex.

Continuation-in-part of Ser. No. 69,140, May 28, 1993, abandoned. This application Jun. 29, 1994, Ser. No. 268,804

Int. Cl.[6] A23C *20/00*

U.S. Cl. 426—582 **20 Claims**

1. An imitation cheese product containing caseinate, wherein the improvement comprises replacing at least a portion of said caseinate with a caseinate replacement composition comprising a hydroxypropylated, high amylose granular starch having a degree of substitution greater than 0.04 and a gel component.

5,486,376

HEAT-RESISTANT CHOCOLATE COMPOSITION AND PROCESS FOR THE PREPARATION THEREOF

Jari Alander, Karlshamn; Torbjörn Wärnheim, Bromma, and Erwin Lühti, Karlshamn, all of, Sweden, assignors to Karlshamns Oils & Fats AB, Karlshamn, Sweden

PCT No. PCT/SE92/00876, § 371 Date Aug. 2, 1994, § 102(e) Date Jun. 17, 1994, PCT Pub. No. WO93/12664, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 18, 1992, Ser. No. 244,980

Claims priority, application Sweden, Dec. 20, 1991, 9103783

Int. Cl.[6] A23G *1/00*

U.S. Cl. 426—660 **20 Claims**

1. A heat-resistant composition prepared by mixing a chocolate mass with a solution consisting essentially of a water-in-oil microemulsion comprising water, fat and an emulsifier wherein the water of the microemulsion is present in the form of droplets having a size of 10–1,000 Å.

5,486,377

METHOD FOR MANUFACTURING CHIP-LIKE ELECTRONIC PARTS

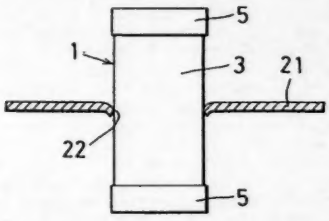
Mitsuro Hamuro; Shigeyoshi Matsuda, and Shoichi Kawabata, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Mar. 7, 1994, Ser. No. 206,159

Claims priority, application Japan, Mar. 5, 1993, 5-071153

Int. Cl.[6] C23C *18/31*; **H01G** *13/00*

U.S. Cl. 427—79 **6 Claims**



1. A method for manufacturing an electronic part having a ceramic central body and two external electrodes formed on opposite ends of the central body, each external electrode being comprised of an inside electrode and a plated layer, said method comprising the steps of:

providing an electronic part having a ceramic central body and two inside electrodes formed on opposite ends of the central body,

providing a retainer sheet having opposite sides and having a plurality of spaced openings therethrough for receiving and holding the central body of the electronic part,

inserting one of the ends of the electronic part into one of the plurality of spaced openings of the retainer sheet so that the central body of the electronic part is held by the retainer sheet and so that the two inside electrodes formed on opposite ends of the central body are disposed on opposite sides of the retainer sheet,

moving the retainer sheet holding the electronic part to a plating station for passing the electronic part with the two inside electrodes through a plating liquid, thereby plating the two inside electrodes of the electronic part to form external electrodes thereon, and

moving the retainer sheet holding the plated electronic part to a cleaning and drying station for cleaning and drying the plated electronic part of excess plating liquid to obtain the electronic part having a ceramic central body and two external electrodes formed at opposite ends thereof.

5,486,378

METHOD AND APPARATUS FOR MANUFACTURING AN OPTICAL RIBBON CONDUCTOR

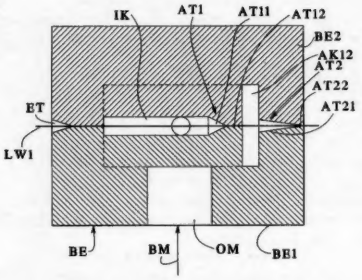
Ulrich Oestreich, Munich; Peter Dotzer, Berg/Bachhausen, and Siegfried Unterberger, Coburg, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 11, 1993, Ser. No. 105,401

Claims priority, application Germany, Aug. 11, 1992, 42 26 600.9; Jun. 4, 1993, 43 18 664.5; Jun. 8, 1993, 43 19 087.1

Int. Cl.[6] B05D *5/66*

U.S. Cl. 427—163.2 **39 Claims**



1. In a method for manufacturing an optical ribbon conductor having a plurality of aligned light waveguides surrounded by an external coating, which includes providing coating means for applying a curable coating material on waveguides, means for supplying the curable coating material to the coating means, conducting a plurality of pre-coated light waveguides through the coating means to enclose the light waveguides in the coating material, the improvements comprising guiding the light waveguides to freely run both proceeding as well as in the coating means to essentially come in contact only with the supply of liquid coating material in the coating means, creating a drag flow of the liquid coating material by the longitudinal movement of the light waveguide through the coating material in a tapering discharge channel having a rectangular cross section, utilizing the drag flow to create a self-alignment of the light waveguides within the coating material and the coating means, said self-alignment providing a uniform and symmetrical distribution of the light waveguide within the contour of the ribbon conductor with the axes of the light waveguides being arranged practically in one plane and the coating material being applied on the light waveguides with approximately the same thickness, and then completing the forming of the ribbon conductor by curing said liquid coating material after leaving the coating means to form the external coating for holding the plurality of aligned light waveguides together.

13. An apparatus for manufacturing an optical ribbon conductor having a plurality of light waveguides extending side-by-side and coated with a coating material, said apparatus including coating means applying a coating on waveguides and means for positioning a plurality of waveguides side-by-side with their axes being arranged practically in one plane and with the coating material being applied on the light waveguides with approximately the same thickness, and guiding the waveguides into an entrance of the coating means, the improvements comprising the entrance and exit of the coating means being dimensioned so that the light waveguides are guided freely in the coating means to come into contact only with the coating material, said coating means including at least one discharge channel having a rectangular cross section and tapering in a throughput direction with the taper creating a drag flow of the coating material to occur due to the longitudinal motion of the waveguides through said discharge opening.

5,486,379

METHOD OF MANUFACTURING A PART MADE OF COMPOSITE MATERIAL COMPRISING FIBER REINFORCEMENT CONSOLIDATED BY A LIQUID PROCESS

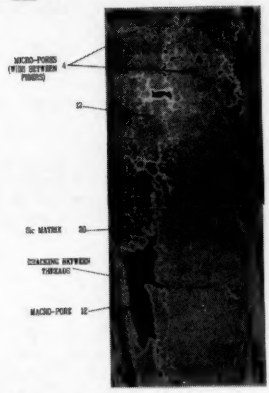
Eric Bouillon, Talence; Jean-Luc Leluan, Bordeaux, and Eric Lavasserie, Begles, all of, France, assignors to Societe Europeenne de Propulsion, Suresnes, France

Filed Jul. 1, 1994, Ser. No. 269,551

Claims priority, application France, Jul. 5, 1993, 93 08177

Int. Cl.[6] B05D *7/00*

U.S. Cl. 427—212 **7 Claims**



1. A method of manufacturing a part made of a composite material, the method comprising the steps of:

making a consolidated fiber preform by a liquid process which includes impregnating a fiber fabric with a liquid precursor of a consolidating material, shaping the impregnated fiber fabric to a form substantially similar to that of the part to be manufactured, and transforming the precursor into said consolidating material to obtain a self-supporting fiber preform,

depositing an interphase layer within said consolidated fiber preform, and

densifying the consolidated fiber preform provided with said interphase layer by a matrix,

whereby said deposition layer and densification step do not require the use of supporting tooling for the preform.

5,486,380

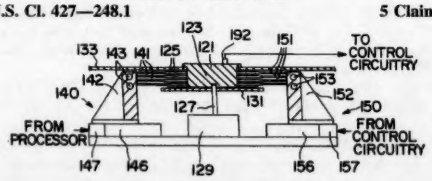
APPARATUS AND METHOD FOR DEPOSITING A SUBSTANCE ON A ROTATING SURFACE

Dan O. Enniss, Sandy, Utah, and Matthew Simpson, Sudbury, Mass., assignors to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

Filed Dec. 30, 1993, Ser. No. 175,586

Int. Cl.[6] C23C *14/22*

U.S. Cl. 427—248.1 **5 Claims**



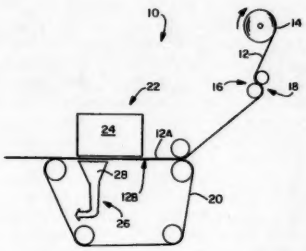
1. A method for depositing a substance, comprising the steps of:
producing a vapor containing constituents of said substance;
providing a rotating mandrel assembly that includes a mandrel, having a deposition surface exposed to said vapor so that said substance is deposited on said deposition surface, and a base having a plurality of radiator fins extending therefrom;
interleaving a plurality of receptor fins with said radiator fins; and
providing heat exchange to said receptor fins to cool said mandrel during deposition of said substance on the deposition surface of said mandrel.

5,486,381

LIQUID SATURATION PROCESS

Terry R. Cleveland, Woodstock; Cherie H. Everhart, Alpharetta; Fred R. Radwanski, and Henry Skoog, both of Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 22, 1994, Ser. No. 231,608
Int. Cl.[6] B05D *1/30*
U.S. Cl. 427—294 **4 Claims**



1. A continuous, short dwell time process of non-compressively and uniformly applying a liquid saturant throughout a permeable sheet, the process comprising:
providing a continuously advancing permeable sheet having a first surface and a second surface;
depositing a substantially laminar flowing curtain of liquid saturant generally across and onto the first surface of the continuously advancing permeable sheet; and
applying a vacuum to the second surface of the continuously advancing permeable sheet substantially simultaneous with the deposition of the liquid saturant; and
drawing a substantial portion of the liquid saturant through the permeable sheet in less than about 1 second to generate a substantially uniform distribution of liquid saturant throughout the permeable sheet.

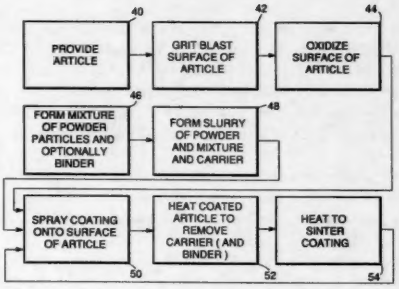
5,486,382

METHOD FOR PREPARING A CERMET-COATED ARTICLE

Joseph A. Ference, San Diego; Ronald E. Bullock, Cardiff; Donald A. Uhlir, San Diego; Michael L. Duhl, San Diego, and Sam A. Ropelato, San Diego, all of Calif., assignors to Hughes Missile Systems Company, Los Angeles, Calif.

Filed May 6, 1993, Ser. No. 57,392
Int. Cl.[6] B05D *3/02*
U.S. Cl. 427—376.3 **16 Claims**

1. A method for preparing a cermet-coated article, comprising the steps of:
providing an oxidized surface on an article to be coated, including the step of providing an article made of a material selected from the group consisting of a nickel-base alloy, a cobalt-base alloy, an iron-base alloy, and a titanium-base alloy;
preparing a mixture of



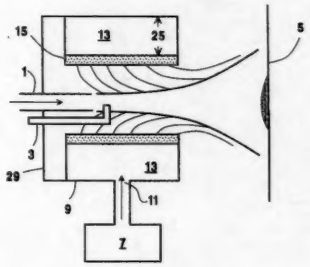
a metallic powder having a mean particle size of less than about 5 micrometers, and
a ceramic powder having at least some of the particles of a size less than that of the mean particle size of the metallic powder,
forming a slurry of the mixture of the metallic powder and the ceramic powder with a liquid carrier;
applying a coating of the slurry onto the oxidized surface of the article; and
thermally processing the coated article, the step of thermally processing the coated article, the step of thermally processing including the steps of
heating the coated article to a temperature sufficient to vaporize and remove the liquid carrier, and thereafter
heating the coated article to a temperature sufficient to sinter the cermet coating.

5,486,383

LAMINAR FLOW SHIELDING OF FLUID JET

Mark S. Nowotarski, Stamford, Conn.; Don J. Lemen, Indianapolis, Ind.; William J. Snyder, Ossining, N.Y., and David B. Leturno, Hoover, Ala., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Aug. 8, 1994, Ser. No. 286,200
Int. Cl.[6] B05D *3/06*
U.S. Cl. 427—446 **19 Claims**



1. A process for shielding a fluid containing stream from its surrounding environment, said process comprising:
(a) ejecting a turbulent flow of said fluid containing stream from at least one opening;
(b) emitting a laminar flow of a substantially inert shielding fluid transversely to the flowing direction of said turbulent flow of said fluid containing stream; and
(c) entraining said transversely flowing shielding fluid in said turbulent flow of said fluid containing stream to prevent infiltration of gas and/or vapor from said fluid containing stream's surrounding environment.

5,486,384

PROCESS FOR PRODUCING MULTI-LAYER COATINGS BY THE USE OF CLEAR LACQUERS WHICH ARE CAPABLE OF POLYMERIZATION IN RADICALIC AND/OR CATIONIC MANNER

Udo Bastian, Ratingen, and Manfred Stein, Hürth, both of, Germany, assignors to Herberts GmbH, Wuppertal, Germany

Continuation of Ser. No. 953,412, Sep. 29, 1992, abandoned. This application Nov. 5, 1993, Ser. No. 148,025

Claims priority, application Germany, Jan. 8, 1991, 41 33 290.3

Int. Cl.[5] B05D 3/02

U.S. Cl. 427—493 14 Claims

1. Process for producing a multi-layer lacquer coating on a surface provided with a dry basecoat, the process comprising the steps of:

eliminating substantially all light around the surface having a wavelength below 550 nm;

selecting a polyermizing coating agent from a group consisting of radicalic-curable lacquer and cationic-curable lacquer;

applying a layer of the coating agent on the basecoat, the coating agent layer being applied on the basecoat after substantially all light around the surface having a wavelength below 550 nm has been eliminated; and

exposing the coating agent layer to high-energy radiation to polymerize the coating agent and cure the coating agent layer on the basecoat.

5,486,385

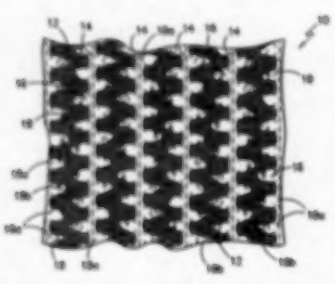
MELTED AND DELUSTERED CAMOUFLAGED FABRIC

Don M. Bylund; Howard C. Willauer, Jr., and James R. Reynolds, all of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 123,456, Sep. 17, 1993. This application May 25, 1995, Ser. No. 449,873

Int. Cl.[5] A01N 5/00

U.S. Cl. 428—17 7 Claims



1. A lightweight composite camouflage construction comprising an open mesh net substrate and a continuous sheet overlying the substrate and bonded to the substrate along at least three spaced lines of attachment, said sheet being cut on opposite sides of said lines of attachment to form a plurality of lobes, each lobe having a base portion attached to the substrate by one of said lines of attachment and an outer end portion free from the substrate to simulate the appearance of natural objects of a terrain, said sheet being color patterned in desired coloration to conform to the terrain in which the camouflage structure is utilized, said plurality of lobes being wrinkled and delustered by an application of heat that is over 400 degrees Fahrenheit.

5,486,386

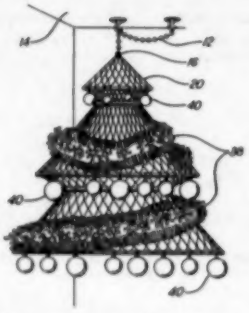
COLLAPSIBLE ARTIFICIAL CHRISTMAS TREE WITH OPEN MESH

Edward J. Rovsek, 2476 Brooklyn Rd., Jackson, Mich. 49203

Filed May 24, 1994, Ser. No. 248,119

Int. Cl.[6] A47G 33/06

U.S. Cl. 428—18 14 Claims



1. An artificial coniferous tree adapted for suspension from a supporting structure, comprising:

an engagement means selectively enraged with the supporting structure for suspending the tree in a display position;

compliant open mesh material approximately forming a conical shape and having a top portion extending from the engagement means;

a plurality of outer hoops fixed to the mesh thereby at least partially defining an outer radial periphery of the mesh, the hoops being disposed approximately concentrically along a substantially vertical axis of the tree in the display position and being graduated from a small diameter hoop located proximate to the engagement means to a large diameter hoop located distal to the engagement means wherein in the display position the weight of the suspended outer hoops tensions the mesh to define the conical shape; and

at least one inner hoop axially located between two diametrically larger axially adjacent outer hoops and fixed to the mesh thereat, wherein when the tree is in the display position the mesh is tensioned by the weight of the rings thereby providing a sawtooth profile representative of a coniferous tree, and further wherein when the engagement means is released from the supporting structure and lowered to a flat surface the tree rings and the mesh collapse into a substantially flat storage position.

5,486,387

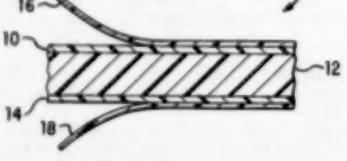
IMPACT MODIFIED MEDICAL FILM

Walter B. Mueller, Inman, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 323,477, Mar. 14, 1989, abandoned. This application Aug. 27, 1993, Ser. No. 113,499

Int. Cl.[6] B32B 27/30; B29C 47/06; B65D 65/02

U.S. Cl. 428—34.7 26 Claims



1. An impact resistant film comprising:

a) two outer layers of a blend of ethylene propylene copolymer containing less than 6% ethylene by weight and a polystyrene/ethylene butylene copolymer/polystyrene block copolymer;

b) a central layer comprising ethylene vinyl acetate copolymer having a melt index less than 1.0; and

c) an intermediate layer disposed between each of the two outer layers and the central layer respectively and comprising ethylene vinyl acetate copolymer having a melt index greater than about 1.0.

5,486,388

ENCLOSURE ASSEMBLY FOR ELONGATE CYLINDRICAL OBJECTS SUCH AS ELECTRIC CABLE SPLICES

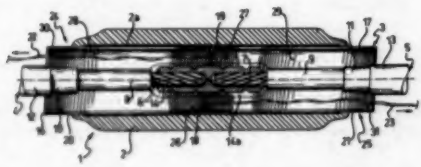
Francesco Portas, Quattordio, and Ubaldo Vallauri, Monza, both of, Italy, assignors to Pirelli Cavi S.p.A., Milan, Italy

Continuation of Ser. No. 985,183, Dec. 2, 1992, abandoned. This application Jan. 9, 1995, Ser. No. 370,558

Claims priority, application Italy, Dec. 16, 1991, MI91A3360

Int. Cl.[6] F16L *11/00*

U.S. Cl. 428—34.9 **21 Claims**



1. An assembly of an elastic sleeve with a tubular supporting body in the bore of said sleeve for the application of said sleeve to a cylindrical body, said assembly comprising:

a radially stretched sleeve of elastic material, the bore of said sleeve having a predetermined radius in its unstretched state;

a tubular supporting body disposed with the bore of said sleeve and having a longitudinal axis, said body having an external surface around said axis of a radius greater than said predetermined radius to cause radial stretching of said sleeve and having an internal surface around said axis of a radius smaller than the radius of said external surface, said body being formed by a plurality of helically wound, contiguous turns of a strip, severable means securing each turn to an adjacent turn and said turns of said body being made of a material of dimensions which provides a radial resistance to the pressure applied thereto by the stretched sleeve sufficient to maintain said sleeve in its stretched state; and

a pull strip extending from a turn at one end of said body within said internal surface for pulling said turns apart;

the improvement wherein said tubular body having a first plurality of said turns within a first selected region and a second plurality of said turns within a second selected region, said first and said second plurality of said turns having a helical pitch and axial thickness, said helical pitch and said axial thickness of said first plurality of said turns being less than said helical pitch and said axial thickness of said second plurality of said turns; said second plurality of said turns being located adjacent to said first plurality of said turns.

5,486,389

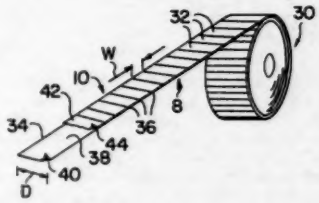
ROLL OF TAPE WITH DOUBLY ADHESIVELY FACED PADS

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Continuation of Ser. No. 109,147, Aug. 19, 1993, abandoned, which is a continuation of Ser. No. 681,861, Apr. 5, 1991, abandoned. This application Oct. 18, 1994, Ser. No. 325,544

Int. Cl.[6] B65D *65/28;* **G09F** *3/00*

U.S. Cl. 428—40 **8 Claims**



1. A roll of tape providing a supply of doubly adhesively faced pads for individual application to a receiving surface, said roll of tape comprising:

a generally elongate flexible base layer of material wound into a roll and having one side with a first release surface;

at least one layer of adhesive releasably bonded to said first release surface of said base layer, said at least one layer of adhesive having a multiplicity of separation lines extending transversely of the length of said base layer and spaced from one another along the length of said base layer to define a plurality of pads of material carried on said first release surface with each pad having two side edges extending generally parallel to each other and arranged in abutting relationship to the adjacent side edges of its two neighboring pads such that said plurality of pads are arranged in succession along the length of said base layer, each of said pads being readily separable from an adjacent one of said pads along the intervening one of said separation lines;

each of said pads having first and second tacky faces facing in opposite directions and having said first of its tacky faces releasably adhered to said first release surface of said base layer; and

barrier means associated with each side edge of each of said plurality of pads for keeping abutting ones of said side edges from adhering to one another, said barrier means being a layer of liquid lubricant material on each side edge of each of said plurality of pads which lubricant material penetrates and weakens said at least one layer of adhesive along said separation lines;

said base layer of material having a second side facing oppositely to said first side, said second side having a second release surface engaging said second tacky faces of said pads,the adherence between said second release surface and said second faces of said pads being less than the adherence between said first release surface and said first faces of said pads so that as said base layer is unrolled from said roll said pads release from said second release surface and remain adhered to said first release surface to expose said second tacky faces of the released pads for application onto a receiving surface such that the pads applied to the receiving surface are thereafter releasable from said first release surface and are cleanly separable along one of said separation lines from the pads not applied to the receiving surface.

5,486,390

RECYCLABLE BLISTER PACKAGE

Donald J. Burns, Lake Zurich, Ill., and A. Michael Nahmias, Victor, N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 28, 1994, Ser. No. 233,095
Int. Cl.[6] B32B 3/16; B65D 75/60
U.S. Cl. 428—40 16 Claims

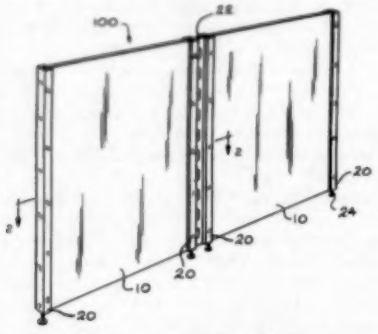
1. A reusable or recyclable blister package comprising:
A) a first sheet selected from the group consisting of polyethylene terephthalate (PET), polyvinyl chloride (PVC), and polyvinyl chloride (PVC) coated with polyvinylidene chloride (PVDC) having a blister which forms a compartment;
B) a second sheet releasably adhered to said first sheet, said second sheet comprising an oriented polypropylene (OPP) peel seal film having its side proximal to said first sheet coated with a first adhesive having controlled adhesion of 300–1200 grams per inch; and
C) a third sheet of card or paper stock which is adhered to said second sheet at at least fiber tear adhesion levels with a second adhesive.

5,486,391

PORTABLE FABRIC COVERED DIVIDER PANELS

Jeffrey D. Tyner, 2879 Canyonside Ct. NE., Grand Rapids, Mich. 49505

Filed Jul. 5, 1994, Ser. No. 270,730
Int. Cl.[6] B32B 3/06;27/10;27/32;27/40
U.S. Cl. 428—44 41 Claims



1. A panel for use as a space divider, which comprises:
(a) a polystyrene bead board core configured in a shape defining the panel of the space divider;
(b) a flexible plastic film layer adhered by an adhesive to the core to provide an outside surface of the panel and covering the core to thereby provide structural strength for the core, wherein the panel is able to withstand repeated punctures in a single hole by a fastening means without compromising the strength and integrity of the panel adjacent the hole and such that the plastic film layer retains the fastening means in the hole after each puncture;
(c) holding means mounted adjacent the core for holding the panel in an upright position such that the panel provides a divider for a space; and
(d) a decorative outer layer covering at least a first portion of the core and the plastic film layer.

5,486,392

ROLL-UP FLOOR MAT

Edward J. Green, Eagan, Minn., assignor to Reese Enterprises, Inc., Rosemount, Minn.

Filed Jul. 5, 1994, Ser. No. 270,480
Int. Cl.[6] B32B 3/10
U.S. Cl. 428—54 14 Claims

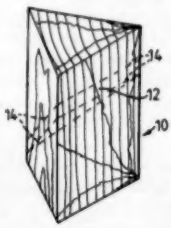
1. A floor mat adapted to be rolled up, comprising:
a plurality of rigid, elongated rails disposed generally parallel to each other in spaced relationship, each of the rails including a base portion supporting a tread surface and a pair of parallel side members connected to the lateral sides of the base portion, each of the side members defining a passageway for receiving an arrangement of a coupling member;
a plurality of flexible, resilient, elongated coupling members each interconnecting a pair of rails in parallel, spaced relationship, each of the coupling members including a web with longitudinal side margins, an arrangement connected to each of the side margins and being received by said passageway to engage the corresponding side member of the rail, the web being at the bottommost position in the floor mat, wherein the cross section of each of the webs has a thicker dimension proximate to the side margins than distal to the side margins.

5,486,393

METHOD OF MANUFACTURING SHEET ELEMENTS OF END-WOOD TYPE AND ELEMENT MANUFACTURED THEREBY

Martin Wiklund, Mosstorpsvägen 40, S-183 30 Täby, Sweden

PCT No. PCT/SE93/00902, § 371 Date May 16, 1994, § 102(e) Date May 16, 1994, PCT Pub. No. WO94/09955, PCT Pub. Date May 11, 1994
PCT Filed Oct. 29, 1993, Ser. No. 244,029
Claims priority, application Sweden, Nov. 4, 1992, 9203292
Int. Cl.[6] B32B 3/14; B27D 1/00
U.S. Cl. 428—58 13 Claims



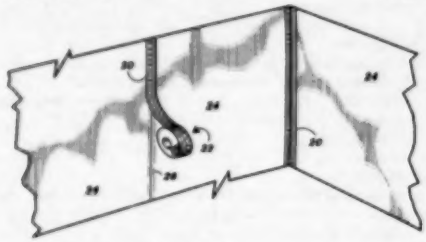
1. Method of manufacturing a sheet element of end-wood type for use as a wear surface for a floor, table or the like, comprising the steps of:
sawing a longitudinally sawn piece of wood with parallel cuts oblique to a longitudinal direction of said sawn piece of wood, into plates, a cut area of which is greater than a cross-sectional area of the piece of wood,
whereafter laying the plates next to each other, and
joining them together with complementarily shaped edge surfaces to form a sheet end-wood element.

5,486,394

SELF-RELEASE SELF-ADHESIVE DRYWALL TAPE

Ronald A. Stough, Hinsdale, Mont., assignor to E-Z Taping System, Inc., Green Bay, Wis.

Filed Aug. 26, 1994, Ser. No. 297,320
Int. Cl.[6] B32B 3/10
U.S. Cl. 428—61 7 Claims



1. A wallboard assembly comprising:

a) a first sheet of drywall;

b) a second sheet of drywall positioned adjacent to the first sheet to define a seam therebetween; and

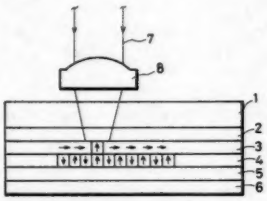
c) a strip of drywall tape affixed to the first sheet and the second sheet to bridge the seam, wherein the drywall tape has a first layer of flexible paper material, having an inwardly facing pressure-sensitive adhesive coating thereon, the adhesive serving to attach the tape to overlie the seam between said sheets of drywall; a second layer of reinforcing fiber strands, wherein the second layer overlies the first layer; and a third layer of flexible material which overlies the fiber strands to encapsulate the fiber strands between the first layer and the third layer, wherein the third layer has an outwardly facing release coating such that the first layer adhesive will releasably engage the third layer for manual separation of the tape when rolled upon itself.

5,486,395

MAGNETO-OPTICAL DISK

Yoshiteru Murakami, Nishinomiya; Naoyasu Iketani, Tenri; Akira Takahashi, Nara, and Kenji Ohta, Kitakatsuragi, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1992, Ser. No. 984,350
Claims priority, application Japan, Dec. 5, 1991, 3-321932
Int. Cl.[6] B32B 3/02; G11B 5/66
U.S. Cl. 428—64.3 11 Claims



1. A magneto optical disk comprising:

a circular substrate;

a recording layer, formed on said substrate, for a recording of information;

a readout layer, formed between said substrate and said recording layer, for a reproduction of information recorded on said recording layer,

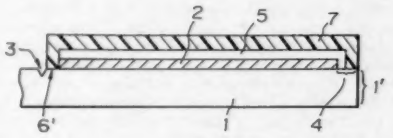
wherein said readout layer has a Curie temperature which is higher than a Curie temperature of said recording layer, exhibits its in-plane magnetization at room temperature and a change from in-plane magnetization to perpendicular magnetization when its temperature rises as a result of an application of a light beam, and wherein a first temperature at which a change occurs from in-plane magnetization to perpendicular magnetization is set such that it increases from a peripheral edge of said magneto-optical disk toward a center thereof.

5,486,396

OPTICAL RECORDING MEDIUM AND PRODUCTION THEREOF

Tadahiko Mizukuki, Tokyo; Kouichi Yabuuchi, Yamanashi; Shinichi Murakami, Kamakura; Tomoyoshi Sasakawa, Chiba; Kouhei Shizuka, Yokohama; Nobuhisa Kitagawa, Yokohama, and Sumio Hirose, Yokohama, all of, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 176,929, Jan. 3, 1994, Pat. No. 5,424,102, which is a division of Ser. No. 885,784, May 20, 1992, abandoned. This application Apr. 5, 1995, Ser. No. 417,257
Claims priority, application Japan, May 21, 1991, 3-116024; Nov. 1, 1991, 3-287663
Int. Cl.[6] B32B 3/00
U.S. Cl. 428—64.2 8 Claims



1. An optical recording medium comprising:

a transparent resin substrate having an inner peripheral portion and an outer substrate periphery;

a dye-containing recording layer spin-coated onto and overlying the substrate and having an inner recording periphery and an outer recording periphery, the inner recording periphery being displaced outwardly from the inner peripheral portion of the substrate and the outer recording periphery being displaced inwardly from the outer substrate periphery;

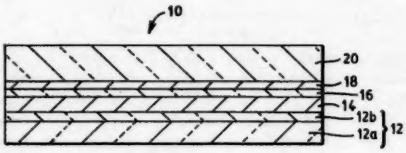
a metal reflective layer overlying the recording layer, the metal reflective layer having an inner reflective periphery, which is coterminous with the inner periphery of the recording layer, and an outer reflective periphery which extends beyond the outer recording periphery and onto but not coterminous with the outer peripheral edge of the substrate; and

a protective layer overlying the metal reflective layer and having an inner peripheral protective portion and an outer peripheral protective portion, the inner peripheral protective portion overlying the inner peripheral portion of both the recording layer and the metal reflective layer and contacting the inner peripheral portion of the substrate and containing dissolved therein a portion of the recording layer, the outer peripheral protective portion overlying the outer peripheral reflective portion and contacting the substrate proximate the outer substrate periphery, and the protective layer being produced from a liquid resin capable of dissolving the recording layer upon contact therewith and the recording layer being produced by being spin coated onto the substrate of the inner periphery of the reflective layer thereafter applied over the recording layer and the inner peripheral portion of the recording layer which extends inwardly from and lacks a coating of the metal reflecting layer thereon thereafter being selectively removed by being dissolved in the liquid resin used to form the protective layer by contact therewith.

5,486,397
PROTECTED REFLECTION IMAGE

James N. Gordon, Newton, and Ganghui Teng, Bedford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 29, 1994, Ser. No. 236,491
Int. Cl.[6] B32B *1/04*
U.S. Cl. 428—76 9 Claims



1. A protectively reflected binary image comprising

a thermally imaged transparency and a reflective protective overcoat;

the image transparency comprising a transparent supporting substrate and a binary image supported on the substrate, the binary image being a plurality of first areas at which a porous or particulate image-forming substance is adhered to the substrate and a plurality of second areas at which the substrate is free from the image-forming substance;

the reflective protective overcoat having a uniform opaque area corresponding with the extents of the binary image and comprising at least a durable layer, the opaque area incorporating therein a substantially uniform distribution of reflective pigments, the reflective protective overcoat further comprising a reflective layer configured as said opaque area interposed between the durable layer and the thermally imaged medium.

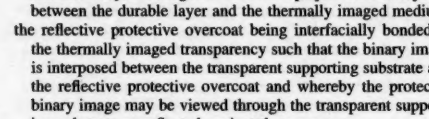
the reflective protective overcoat being interfacially bonded to the thermally imaged transparency such that the binary image is interposed between the transparent supporting substrate and the reflective protective overcoat and whereby the protected binary image may be viewed through the transparent supporting substrate as reflected against the opaque area.

5,486,398
LOW FLAMMABILITY CARPET FLOOR COVERING

Manfred Weber, Glashütten, and Gerhard Schwarz, Hanau, both of, Germany, assignors to Hoechst Aktiengesellschaft

Filed Sep. 28, 1993, Ser. No. 127,644
Claims priority, application Germany, Sep. 30, 1992, 9212981 U; Jun. 18, 1993, 9309105 U
Int. Cl.[6] B32B *33/00;* D03D *27/00*
U.S. Cl. 428—95 10 Claims

1. A low flammability carpet floor covering comprising a backing material, a tied-in pile yarn, and a back finish, wherein the pile yarn comprises low flammability synthetic fibers, the backing material comprises normal or low flammability synthetic fibers, and the back finish comprises a polyurethane composed of the radicals of the formulae I to VII:



where

A1 is an aliphatic radical having from 2 to 12 carbon atoms,

A2 is a phenyl radical

A3 is an aliphatic radical having 2–10 carbon atoms, with n and m each being 1 or 2 and n+m being 3 or 4, and each of the n oxygen atoms being attached to A3,

B1 is an aliphatic or cycloaliphatic radical having 2–10 carbon atoms,

B2 is an aliphatic or cycloaliphatic radical having 3–6 carbon atoms with p being 1 or 2 and each of the p oxygen atoms being attached to B2,

C1 is an aliphatic or mono- or bicyclic cycloaliphatic radical having from 2 to 12 carbon atoms, and

D1 is an aliphatic or mono- or bicyclic cycloaliphatic radical having from 5 to 36 carbon atoms carbon atoms,

the proportions of the radicals I to III, based on their total amount, are within the following limits:

I : 40 to 80 mol %,

II : 10 to 40 mol %,

III : 0 to 25 mol %,

the proportions of the radicals IV, V and VI, based on their total amount, are within the following limits:

IV : 65 to 95 mol %,

V : 0 to 19 mol %,

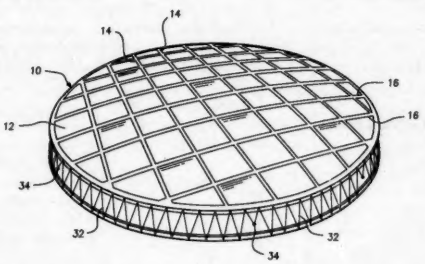
VI : 3 to 16 mol %,

the radicals of the formulae I, II and IV are polyester blocks having an average molecular weight ($\overline{M}_n$) of from 400 to 6000 and the proportions of the radicals of the formula VII, based on the total amount of all the components of the polyurethane resin, are from 5 to 35 mol %, and the weight proportions of polyurethane finish in the low flammability carpet floor covering is 150 to 500 g/m^2.

5,486,399
SELF-SUPPORTING CONVEX COVER FOR SPACECRAFT

Louis B. Brydon, San Carlos; Samuel R. Moore, and Peter W. Lord, both of Palo Alto, all of Calif., assignors to Space Systems/Loral, Inc., Palo Alto, Calif.

Continuation of Ser. No. 819,285, Jan. 13, 1992, abandoned.
This application Sep. 30, 1993, Ser. No. 130,158
Int. Cl.[6] B32B *3/06;3/12;3/28;* H01Q *15/02*
U.S. Cl. 428—99 13 Claims



5. A self-supporting convex cover for spacecraft hardware, comprising:

a sheet of laminated material comprising a conductive layer and a thermal control layer, said thermal control layer comprising a film layer, a mesh layer, and a thermally reflective coating;

a first plurality of stiffener elements attached to the material for holding the material in a convex shape; and

a connector for attaching the material to the spacecraft hardware;

wherein the stiffener elements further comprise strips of a material having a channel shape placed between the conductive layer and the thermal control layer and attached to the thermal control layer to form box beam structures in the laminated material;

wherein the stiffener elements further comprise foam ribs inserted between the channel shaped strips and the thermal control layer to which the channel shaped strips are attached to define the box beam shape of the stiffeners.

5,486,400

CHRISTMAS TREE ORNAMENT PROTECTOR

James D. Fishel, 8313 Crown Court Rd., Alexandria, Va. 22308

Filed Nov. 28, 1994, Ser. No. 348,206
Int. Cl.[6] B32B *3/12*
U.S. Cl. 428—116 9 Claims

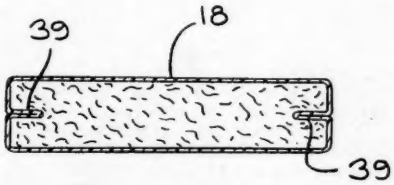
1. A Christmas tree ornament protector comprising:
a top layer having an opening for receiving a trunk of a Christmas tree;
a bottom layer adjacent to said top layer, said bottom layer made of a shock absorbent material and also having an opening for receiving said trunk; and
a plurality of fasteners for attaching said top and bottom layers.

5,486,401

INSULATION ASSEMBLY AND METHOD OF MAKING

Larry J. Grant, Westerville; Raymond V. Monnin, Perrysburg, and James W. Scott, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Filed May 9, 1994, Ser. No. 239,820
Int. Cl.[6] B32B *3/04*
U.S. Cl. 428—125 10 Claims



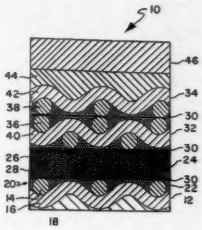
1. A non-rigid mineral fiber insulation assembly comprising, a fibrous body having opposed top and bottom surfaces, opposed side edges and opposed ends, each of said side edges including a longitudinally extending tuck, and each of said opposed ends being free of a transversely extending tuck.

5,486,402

PRINTING BLANKET HAVING PRINTING FACE SURFACE PROFILE WITHIN SPECIFIED ROUGHNESS RANGE

W. Toriran Flint, Spartanburg, and Joseph L. Byers, Inman, both of S.C., assignors to Reeves Brothers, Inc., Spartanburg, S.C.

Division of Ser. No. 835,795, Feb. 14, 1992, Pat. No. 5,364,683. This application Oct. 12, 1994, Ser. No. 322,041
Int. Cl.[6] B32B *3/00*; D06N *7/04*
U.S. Cl. 428—141 23 Claims



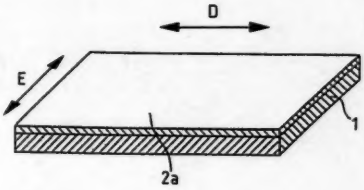
1. A printing blanket comprising:
at least one fabric ply; and
an elastomeric printing face having a surface profile with a roughness average of between about 0.6 microns and about 0.95 microns to enhance releasability while reducing dot gain during printing operations.

5,486,403

ALIGNMENT LAYER FOR LIQUID CRYSTAL ELEMENT AND METHOD OF PRODUCING SAME

Yoshihiko Ishitaka; Yumiko Sato; Munemitsu Abe, all of Sendai; Yorihiko Sasaki, Miyagi; Mitsuru Kano, Furukawa; Arao Sato, Sendai, and Kiyomi Sugawara, Iwaki, all of, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1994, Ser. No. 218,476
Claims priority, application Japan, Apr. 2, 1993, 5-100500; Jan. 12, 1993, 5-341435
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—167 2 Claims

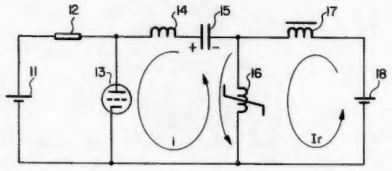


1. An orientation layer for liquid crystal element, the orientation layer comprising:
a macromolecular material deposited on a substrate, the macromolecular material composed of main molecular chains on the average being aligned in a specified direction,
a plurality of parallel microgrooves repeatedly formed on a surface of said macromolecular material, the microgrooves being aligned in a second direction, the second direction being perpendicular to said specified direction, each pair of adjacent microgrooves being separated by first and second sides forming a triangular ridge, the first and second sides being different in length from each other.

5,486,404
NANO-CRYSTALLINE SOFT MAGNETIC ALLOY RIBBON WITH INSULATION COATING AND MAGNETIC CORE MADE THEREFROM AND PULSE GENERATOR, LASER UNIT AND ACCELERATOR THEREWITH

Shin Nakajima, Kumagaya; Michiyuki Fukushima, and Noriyoshi Hirao, both of Saitama, all of, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 20, 1994, Ser. No. 246,429
Claims priority, application Japan, May 21, 1993, 5-119548
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—172 **13 Claims**

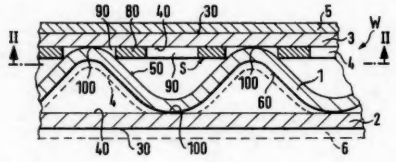


1. A nano-crystalline soft magnetic alloy ribbon having nano-crystalline particles of an average particle size of 50 nm or less occupying at least 50% of the alloy structure, the surface of the ribbon having a ceramic insulation coating which is thicker at each end than the center, in the transverse direction of the ribbon, wherein the thickness (dx) of the insulation coating at the ends of the ribbon and the average thickness (da) of the insulation coating determined by a mass measurement method have relations of 1.2 (da)≦(dx)≦5 (da) and (dx)≦10 μm.

5,486,405
METHOD OF PRODUCING A CORRUGATED BOARD AS WELL AS A CORRUGATED BOARD

Wolf-Henning Laves, Groenenbach, Germany, assignor to Hans Kolb Wellpappe GmbH & Co., Germany

Filed Oct. 4, 1993, Ser. No. 131,145
Claims priority, application Germany, Jan. 14, 1992, 42 34 689.4; European Pat. Off., Feb. 3, 1993, 93101662
Int. Cl.[6] B32B *3/28;31/00*
U.S. Cl. 428—182 **31 Claims**



1. A corrugated board used for folding cases or for sheet materials for protecting electrostatically endangered articles against electrostatic discharges and electric fields, comprising

a corrugated layer,

a flat layer on one side of said corrugated core layer,

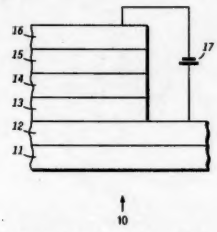
a shielding layer (**4**) positioned between said corrugated core layer and said flat layer, said shielding layer having shielding material is selected from the group consisting of carbon, graphite and mixtures thereof, said shielding layer having a plurality of interspaces (**90**), and

said corrugated layer is bonded or glued to said flat layer at at least some of said interspaces.

5,486,406
GREEN-EMITTING ORGANOMETALLIC COMPLEXES FOR USE IN LIGHT EMITTING DEVICES

Song Q. Shi, Phoenix, Ariz., assignor to Motorola, Schaumburg, Ill.

Filed Nov. 7, 1994, Ser. No. 334,999
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—209 **5 Claims**

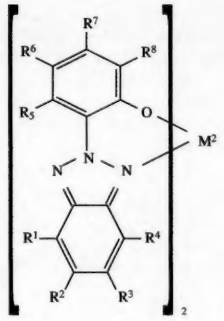


1. An organic light emitting device comprising:

a first conductive layer;

a layer of first carrier transporting and second carrier blocking material positioned on the first conductive layer;

a layer of organometallic material positioned on the layer of first carrier transporting and second carrier blocking material and having the following general formula:



where:

M^2 is a divalent metal ion, and

R^1 to R^8 represent substitution possibilities at each position and each represent hydrogen or hydrocarbon groups or functional groups;

a layer of second carrier transporting and first carrier blocking material positioned on the layer of organometallic material; and

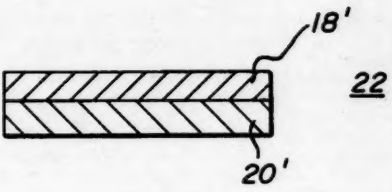
a second conductive layer positioned on the layer of second carrier transporting and first carrier blocking materials.

5,486,407
HIGH RUBBER BACKING MULTI-LAYER ABS SYSTEM WHICH EXHIBITS IMPROVED CHEMICAL RESISTANCE TO HCFC BLOWING AGENTS

John L. W. Noell; Satish Gaggar, both of Parkersburg; George P. McCarty, and Kenneth Miller, both of Vienna, all of W. Va., assignors to General Electric Co., Pittsfield, Mass.

Filed Jun. 8, 1993, Ser. No. 73,869
Int. Cl.[6] B32B *7/02*
U.S. Cl. 428—215 **11 Claims**

1. A thermoformable, coextruded, multilayer sheet comprising a first chemically resistant ABS resin layer of a first ABS resin comprising a rubbery polymer substrate having grafted thereon a vinyl aromatic-unsaturated nitrile grafting copolymer, said vinyl aromatic-unsaturated nitrile grafting copolymer being present in



said first layer in an amount from 75 to 90 weight percent based on the total weight of the first ABS resin, said first ABS resin having a diene rubber content of from 10 to 25 percent by weight based on the total weight of the first ABS resin, a second ductile ABS resin layer of a second ABS resin comprising a polymeric diene rubber substrate and having grafted thereon a vinyl aromatic-unsaturated nitrile grafting copolymer, said vinyl aromatic-unsaturated nitrile grafting copolymer being present in said second layer in an amount from 50 to 65 weight percent based on the total weight of the second ABS resin, said polymeric diene rubber substrate being present at a level of from 35 to 70 percent by weight based on the total weight of the second ABS resin said vinyl aromatic-unsaturated nitrile grafting copolymer being present in said first and said second layer comprises from 25 to 40 weight percent of one unsaturated nitrile monomer and from **60** to **75** weight percent of at least one vinyl aromatic monomer selected from the group consisting of styrene, α-methylstyrene, and halogen-substituted styrene.

5,486,408

LAMINATED FIRE RESISTANT SHEET MATERIAL

Joseph S. Sentendrey, Parma, Ohio, assignor to Rexam Industries Corp., Matthews, N.C.

Division of Ser. No. 45,033, Apr. 7, 1993. This application Sep. 22, 1994, Ser. No. 310,571

Int. Cl.[6] B32B *7/00*

U.S. Cl. 428—220 **10 Claims**

1. A fire retardant laminate structure that is particularly suitable as moisture barrier thermal insulation in buildings, said laminate structure comprising:

a first web of a flexible moisture barrier material;

a second web of flexible material overlying said first web; and

an admixture of an uncured substantially solvent-free adhesive and a fire retardant composition between said first and second webs for adhesively joining said webs when the adhesive in said adhesive admixture is cured and set;

said admixture having a viscosity of between about 20,000 and 30,000 centipoise per second and being present in an amount of between about 5 and 15 pounds per ream; and

said fire retardant composition being present in said admixture in a ratio by weight of between about 0.5:1 and 4:1, retardant:adhesive.

5,486,409

NONWOVEN FABRICS FROM HIGH NITRILE COPOLYMERS

Benedict S. Curatolo, Valley View; George S. Li, Solon, and Brandford E. Giddings, Shaker Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 79,183, Jun. 17, 1993, abandoned. This application Oct. 17, 1994, Ser. No. 324,290

Int. Cl.[6] D04H *3/00*

U.S. Cl. 428—221 **21 Claims**

1. A non-woven fabric produced from fibers formed in the absence of a solvent or a plasticizing agent from melt processable and stable copolymers containing 30 to 90 weight percent acrylonitrile moiety and up to 70 weight percent methacrylonitrile moiety and optionally less than 20 weight percent moieties of other comonomers wherein said copolymers are produced by an aqueous emulsion polymerization.

5,486,410

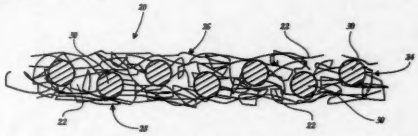
FIBROUS STRUCTURES CONTAINING IMMOBILIZED PARTICULATE MATTER

H. Gunter Groeger; George A. Serad, and Clinton D. Felton, all of Charlotte, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 977,995, Nov. 18, 1992, abandoned. This application May 17, 1994, Ser. No. 245,103

Int. Cl.[6] B32B *5/16*

U.S. Cl. 428—283 **12 Claims**



1. A fibrous structure comprising a macrofiber matrix formed from composite fiber comprising a structural component, and a lower melting polyamide that melts at a temperature of less than 220° C., and comprising immobilized functional particulate thermally bonded to said macrofiber matrix by said polyamide.

5,486,411

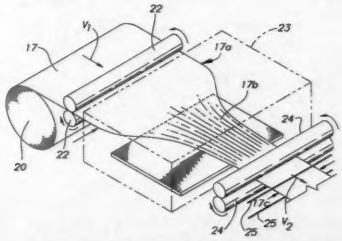
ELECTRICALLY CHARGED, CONSOLIDATED NON-WOVEN WEBS

Charles B. Hassenboehler, Jr., and Larry B. Wadsworth, both of Knoxville, Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation-in-part of Ser. No. 858,182, Mar. 26, 1992, Pat. No. 5,244,482. This application Sep. 28, 1992, Ser. No. 952,355 The portion of the term of this patent subsequent to Sep. 14, 2010, has been disclaimed.

Int. Cl.[6] B32B *27/00*

U.S. Cl. 428—286 **41 Claims**



1. A post-electrostatically charged, consolidated nonwoven web of improved filtration performance which is consolidated and elastic in the cross-direction, which consolidated web is made by

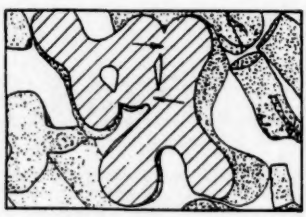
drawing and heat setting a precursor nonwoven web of nonelastomeric, thermoplastic fibers, wherein the consolidated web has a reduced average pore size and reduced pore size distribution with respect to the precursor web, the web comprising a planar layer of randomly organized, nonelastomeric thermoplastic fibers bonded to each other, a majority of fibers being aligned generally in the direction of draw and a minority of fibers disposed in a cross-direction transverse to the direction of the draw, the consolidated web having a maximum pore size of less than 80% of that of the precursor web, wherein the average pore size reduction which results from lateral contraction of the web during drawing is not accompanied by a significant average fiber diameter reduction of the fibers which are aligned in the direction.

5,486,412

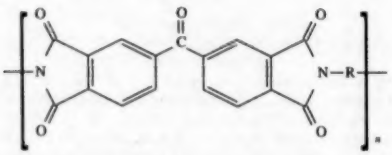
FLAME RETARDANT HIGH-TEMPERATURE-RESISTANT POLYIMIDE FIBERS AND MOLDED ARTICLES MANUFACTURED THEREFROM

Klaus Weinrotter, and Robert Vodiunig, both of Vocklabruck, Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

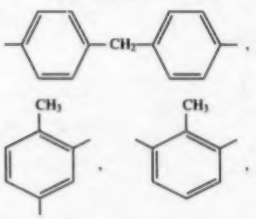
Continuation of Ser. No. 442,351, Oct. 20, 1989, Pat. No. 5,271,889. This application Dec. 16, 1993, Ser. No. 168,558
Claims priority, application Austria, Feb. 26, 1988, A 495/88
Int. Cl.[6] B29D *28/00;* **D04H** *1/04;* **C08G** *8/02;14/00*
U.S. Cl. 428—288 **4 Claims**



1. A rigidified machineable, molded article comprising a quantity of heat-shrunk polyimide fibers fused by cohesive bonds corresponding to the general formula:



wherein R is selected from the group consisting of



and combinations thereof, said quantity of polyimide fibers being sufficient to impart flame retardant and high-temperature stability properties to said molded article and said molded article having a tensile strength of 5–50 N/mm^2, a breaking elongation of 5 %–80%, an E-moduli of 100–500N/mm^2 and a density of 1.20 g/cm^3 or less.

5,486,413

CERAMIC ADHESIVE HAVING A SEALED POROSITY

Kurtis C. Kelley, Washington, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jul. 29, 1994, Ser. No. 282,687
Int. Cl.[6] B32B *27/38*
U.S. Cl. 428—323 **20 Claims**

1. A ceramic adhesive, comprising:

a ceramic matrix, said ceramic matrix being formed from a mixture of a metallic oxide and an alkali silicate in water; and said ceramic matrix further having a sealed porosity;

wherein said porosity of said ceramic matrix is sealed by an organic epoxy resin; and

silicon carbide whiskers dispersed within said ceramic matrix;

wherein said ceramic matrix is formed from a mixture, comprising, in the range of about 50% to about 80% by weight metallic oxide and in the range of about 50% to about 20% by weight alkali silicate in water, and said silicon carbide whiskers being present in the range of about 3% to about 25% by weight of said ceramic matrix; and

wherein said metallic oxide is selected from a group consisting of magnesium oxide, aluminum oxide, zirconium oxide, silicon dioxide and mixtures thereof.

5,486,414

DUAL COATED METAL SUBSTRATES AND METHOD OF MAKING

Oscar E. Roberto, Farmington Hills, and Marc A. Maxim, Sterling Heights, Mich., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed Jul. 18, 1994, Ser. No. 276,284
Int. Cl.[6] B32B *15/04;15/08;* **B05D** *3/04;* **C23F** *7/26*
U.S. Cl. 428—334 **26 Claims**

1. A method for coating a metal substrate, said method comprising steps of:

a) applying onto the metal substrate as a first coating an adherent, water insoluble coating comprising (1) a transition metal compound and (2) at least one pulverulent metal in an organic compound matrix;

b) applying onto the surface of the first coating an acidic aqueous composition comprising dispersed resin solids and an activator which converts the water/resin composition into one which will form on a metallic surface a resinous coating that increases in thickness the longer the surface is contacted with the composition, to form a second uncured autodeposited coating over said first coating; and

c) curing the uncured autodeposited coating formed in step b).

5,486,415

POLYPROPYLENE LAMINATE FILM

Junichi Kimura, Osaka; Kazuki Wakamatsu, Chiba; Masahito Usui, Chiba, and Makoto Satoh, Chiba, all of, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

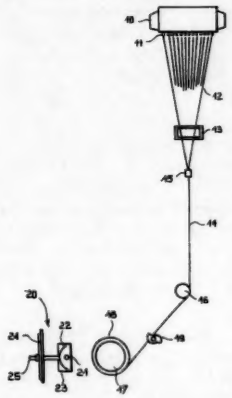
Filed Jul. 8, 1994, Ser. No. 271,981
Claims priority, application Japan, Jul. 8, 1993, 5-168986
Int. Cl.[6] B32B *7/12*
U.S. Cl. 428—349 **11 Claims**

1. A polypropylene laminate film comprising a crystalline polypropylene layer having laminated on at least one surface thereof a copolymer which is a random copolymer of propylene, ethylene, and an α-olefin having at least 4 carbon atoms, the copolymer being obtained by a vapor-phase polymerization using a catalyst system comprising a solid catalyst component containing magnesium, titanium, and a halogen, an organoaluminum compound, and an electron donative compound in substantially the absence of a liquid medium, and satisfying the following requirements (1) to (7):

(1) the ethylene content of the copolymer is from 3.0 to 7.0% by weight,

(2) the content of the α-olefin having at least 4 carbon atoms of the copolymer is from 2.0 to 6.0% by weight,
(3) the ratio of the ethylene content to the content of the α-olefin having at least 4 carbon atoms in the copolymer is at least 1.0,
(4) the melt flow rate of the copolymer is 10 g/10 minutes or less,
(5) the ratio of the weight average molecular weight to the number average molecular weight of the copolymer is 4.5 or less,
(6) the melting point of the copolymer is 135° C. or less, and
(7) the amount of the n-hexane-soluble components in the copolymer is less than 5.5% by weight.

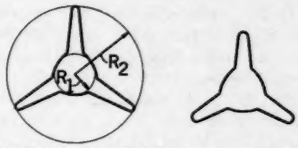
5,486,416
CONTINUOUS THREAD MANUFACTURED BY MECHANICAL DRAWING
Timothy Johnson, Vimines, and Patrick Moireau, Curienne, both of, France, assignors to Vetrotex France, Chambery, France
Division of Ser. No. 61,223, May 17, 1993, Pat. No. 5,352,392. This application May 24, 1994, Ser. No. 248,147
Claims priority, application France, May 15, 1992, 92 05958
Int. Cl.[6] D02G *3/00*
U.S. Cl. 428—357 **4 Claims**



1. Thread made by a process of forming a plurality of continuous filaments by mechanically drawing a plurality of molten thermoplastic material streams from openings in at least one heated die plate, depositing on the surface of at least one of the filaments a mixture in a liquid state which reacts under the effect of ultraviolet radiation, subsequently combining the filaments to form a thread, winding the thread on a rotating support, and exposing the wound thread to ultraviolet radiation during the winding step, wherein the wound thread consists of filaments coated with a mixture having a polymerization reaction rate which is greater than 60%.

5,486,417
MIXED CROSS-SECTION CARPET YARN
Gerry A. Hagen, Anderson, and Wei Li, Salem, both of S.C., assignors to BASF Corporation, Parsippany, N.J.
Continuation of Ser. No. 128,454, Sep. 28, 1993, Pat. No. 5,413,857. This application Jan. 17, 1995, Ser. No. 373,813
Int. Cl.[6] D02G *3/00*
U.S. Cl. 428—357 **9 Claims**

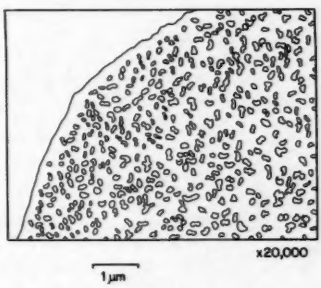
1. A blend of fibers comprising:
about 51 to 90% by weight of base fibers (a) selected from the group consisting of triangular trilobal fibers having a modification ratio ranging from 2.4 to 3.4; hollow pentagonal fibers; standard trilobal fibers having a modification ratio of at least 2.6; pointed lobe trilobal fibers having a modification ratio of at least 2.6; and mixtures thereof; and



TRIANGULAR TRILOBAL, MR = 2.4 AND 3.4

about 10 to 49% by weight of accent fibers (b) selected from the group consisting of standard trilobal fibers having a modification ratio ranging from 1.7 to 2.4; pointed lobe trilobal fibers having a modification ratio ranging from 2.0 to 2.9; and mixtures thereof;
said fibers (a) and (b) having a denier per filament within the range represented by the area enclosed by sides A, B, C, D and E of FIG. 1 and when said fibers (a) and (b) are both pointed lobe trilobal fibers with the same modification ratio and denier per filament, said fibers (a) are delustered and said fibers (b) are not delustered.

5,486,418
WATER-SOLUBLE HEAT-PRESS-BONDING POLYVINYL ALCOHOL BINDER FIBER OF A SEA-ISLANDS STRUCTURE
Akio Ohmory; Tomoyuki Sano; Masahiro Satoh, all of Kurashiki; Syunpei Naramura, Kiyone; Satoru Kobayashi, Kurashiki, and Yosuke Sekiya, Hayashima, all of, Japan, assignors to Kuraray Co., Ltd., Okayama, Japan
Filed Oct. 13, 1994, Ser. No. 322,424
Claims priority, application Japan, Jan. 15, 1993, 5-258117
Int. Cl.[6] D02G *3/04*
U.S. Cl. 428—397 **8 Claims**



1. A water-soluble heat-press-bonding polyvinyl alcohol-containing binder fiber of a sea-islands structure, having a complete-water-dissolution temperature of 100° C. or less such that said fiber completely dissolves in water at said temperature and a tensile strength of 3 g/d or more, in which structure, the sea component is a water-soluble polyvinyl alcohol polymer (A) and the islands component is a water-soluble polymer (B) having a melting point or a fusion-bonding temperature each at least 20° C. lower than the melting point of the polymer (A), and wherein at least part of the islands component in said fiber is present in a fiber zone from 0.01 to 2 μm inside from the fiber surface, said water-soluble polyvinyl alcohol (A) having a saponification degree of 90.0–99 mol % and being comprised of vinyl alcohol units which may be modified with 0.1–3 mol % of a comonomer modifying unit.

5,486,419

RESILIENT, HIGH STRINKAGE PROPYLENE POLYMER YARN AND ARTICLES MADE THEREFROM

Luciano Clementini, Terni, Italy; Adam F. Galambos, New Castle County, Del.; Giuseppe Lesca, Milan; Leonardo Spagnoli, Terni, both of, Italy; Michael E. Starsinic, Cecil County, Md., and Kumar Ogale, New Castle County, Del., assignors to Montell North America Inc., Wilmington, Del.

Continuation of Ser. No. 993,951, Jan. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 824,661, Jan. 23, 1992, abandoned. This application Jan. 10, 1995, Ser. No. 371,056

Claims priority, application Italy, May 29, 1992, MI92A1336

Int. Cl.[6] **D02G** *3/00;* **C08L** *23/00;* **C08F** *10/04*

U.S. Cl. 428—397 **10 Claims**

1. Propylene polymer yarn of increased resiliency and shrinkage, compared to crystalline polypropylene homopolymer yarn, comprising a continuous strand of multiple monofilamcnt fibers, the composition of matter of said fibers consisting essentially of a member of the group consisting of, amounts being expressed as weight %:

I. a blend of crystalline polypropylene homopolymer at a concentration of about 10– 70% of the blend, and (a) a random crystalline terpolymer consisting essentially of about 96.0–85.0% of propylene, about 1.5–15.0% of ethylene, and about 2.5–10% of a C_4–C_8 alpha-olefin or (b) a random, crystalline, propylene polymer consisting essentially of propylene and about 1.5–20.0% of an olefin selected from the group consisting of ethylene and C_4–C_8 alpha-olefins; and

II. propylene polymer material optionally in a blend with crystalline, polypropylene homopolymer, said homopolymer being at a concentration up to about 70% of the blend, said propylene polymer material being selected from the group consisting of:

(a) a composition of random, crystalline, propylene polymers consisting essentially of:

(1) about 30–65% of a copolymer of about 80–98% propylene, and a C_4–C_8 alpha-olefin, and

(2) about 35–70% of a copolymer of propylene and ethylene and optionally about 2–10% of a C_4–C_8 alpha-olefin, said copolymer containing about 2–10% ethylene when said C_4–C_8 alpha-olefin is not present, and about 0.5–5% ethylene when said C_4–C_8 alpha-olefin is present;

(b) a composition of random, crystalline, propylene polymers and a predominantly ethylene copolymer, which composition consists essentially of:

(1) about 15–35% of a terpolymer of about 90–93% propylene, about 2–3.5% ethylene, and about 5–6% C_4–C_8 alpha-olefin,

(2) about 30–75% of a copolymer of about 80–90% propylene, and a C_4–C_8 alpha-olefin, and

(3) about 20–60% of a copolymer of about 91–95% ethylene, and a C_4–C_8 alpha-olefin;

(c) a heterophasic, polyolefin composition consisting essentially of:

(1) 90–55% of polymeric material selected from the group consisting of a polypropylene homopolymer having an isotactic index greater than 90, and a crystalline copolymer of propylene and an alpha-olefin of the formula CH_2=CHR, where R is H or C_2–C_6 alkyl, said olefinic material being less than 10% of the copolymer, and

(2) 10–45% of an elastomeric polymer of propylene and olefinic material selected from the group consisting of alpha-olefins of the formula CH_2=CHR, where R is H or C_2–C_6 alkyl, said olefinic material being 50–70% of said elastomeric copolymer, and 10–40% of said elastomeric copolymer being insoluble in xylene at ambient temperature.

5,486,420

HYDROPHOBIC SILICA POWDER, MANUFACTURING METHOD THEREOF AND DEVELOPER FOR ELECTROPHOTOGRAPHY

Akira Nishihara; Akihiro Nakamura, and Shigehiro Arakawa, all of Omiya, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Feb. 3, 1994, Ser. No. 191,435

Claims priority, application Japan, Feb. 3, 1993, 5-016454

Int. Cl.[6] **B32B** *5/16*

U.S. Cl. 428—405 **4 Claims**

1. A hydrophobic silica powder comprising a silica powder treated with an amino-substituted silane selected from the group consisting of

$H_2N(CH_2)_3Si(OEt)_3$

$H_2N(CH_2)_2NH(CH_2)_3Si(OMe)_3$

$H_2N(CH_2)_2NH(CH_2)_3SiMe(OMe)_2$

$C_6H_5NH(CH_2)_3Si(OMe)_3$ and

$H_2N(CH_2)_2NH(CH_2)_3SiCl_3$

and an organopolysiloxane selected from the group consisting of dimethylpolysiloxane, diphenylpolysiloxane, and methylhydropolysiloxane and having an amount of triboelectrification relative to iron of from +467 μC/g to up to +700 μC/g and a hydrophobing ratio of at least 60%, said hydrophobing ratio being the ratio of transmittance of a 550 nm beam through a suspension of 1.0 g of said silica powder in 100 ml of water to the transmittance of a 550 nm beam through pure water.

5,486,421

CURABLE POLYMER RELEASE COATING COMPOSITION

Hideki Kobayashi, Ichihara, Japan, assignor to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 338,914

Claims priority, application Japan, Nov. 25, 1993, 5-321025

Int. Cl.[6] **B32B** *27/00*

U.S. Cl. 428—421 **20 Claims**

1. A curable polymer composition comprising:

(A) a fluorine-containing polymer that contains at least 2 alkenyl groups in each molecule, said polymer being obtained by the copolymerization of

(a) an acrylic monomer having the general formula

$$CH_2{=}CX{-}COOR'$$

wherein X is selected from the group consisting of hydrogen and a methyl radical and R' denotes a monovalent hydrocarbon group having 4 to 15 carbon atoms which contain at least one —CF_2— group, and

(b) a silicone macromonomer with the general formula

$$CH_2{=}CX{-}COO{-}Q{-}(RMeSiO)_n{-}Me_2SiR^*$$

wherein X has its previously defined meaning, Q denotes a divalent hydrocarbon group having 1 to 8 carbon atoms, R is selected from the group consisting of methyl radical and fluorine-containing monovalent hydrocarbon group having 3 to 8 carbon atoms, Me represents a methyl radical, R* denotes an alkenyl group having 2 to 6 carbon atoms and n is an integer having a value of at least 1;

(B) an organohydrogenpolysiloxane that contains at least 3 silicon-bonded hydrogen atoms in each molecule, the amounts of (A) and (B) being selected so as to provide a molar ratio of alkenyl groups in component (A) to silicon-bonded hydrogen in component (B) of 0.2/1 to 5/1;

(C) a hydrosilylation catalyst; and

(D) a hydrosilylation catalyst inhibitor.

5,486,422

PHOTO-CROSSLINKABLE SILICONES AND THEIR USE

Bernard J. L. Boutevin; Latifa Abdellah, both of Montpellier, France, and Gerardo Caporiccio, Milan, Italy, assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 229,247, Apr. 19, 1994, Pat. No. 5,436,309.
This application Apr. 17, 1995, Ser. No. 422,919
Int. Cl.[6] C08L *83/04;83/07;* C08F *2/50;2/48*
U.S. Cl. 428—447 14 Claims

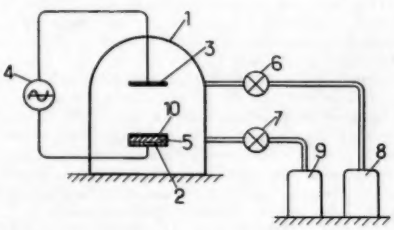
1. A composition comprising a silicone copolymer according to the formula $(I)R_b(R_a)_2SiO(V)_v—(W)_w—(Y)_y—(Z)_z—Si(R_a)_2R_b$ wherein V is a diorganosiloxy unit having monovalent hydrocarbon substituents having 1 to 8 carbon atoms, R_a is selected from the group consisting of methyl, ethyl, n-propyl, n-butyl, pentyl, hexyl, octyl and phenyl provided no more than one phenyl radical is bonded to any silicon atom, R_b is selected from the group consisting of R_a and an oxyalkylene styrene group connected to the silicon atom of a siloxane unit through a group selected from an alkylene unit, an alkylene unit having at least one oxygen atom in the chain and an alkylene unit having at least one sulphur atom in the chain, W is a siloxane unit having an oxyalkylene styrene group connected to the silicon atom of the siloxane unit through a group selected from an alkylene unit, an alkylene unit having at least one oxygen atom in the chain and an alkylene unit having at least one sulphur atom in the chain, Y is a diorganosiloxy unit wherein the organo radicals are selected from the group consisting of hydrocarbon having 1 to 12 carbon atoms and fluorinated hydrocarbon group having 1 to 12 carbon atoms, Z represents a silfluoroalkylene-siloxy unit; v, y and z have identical or different values but they are not simultaneously zero, w is always non-zero and v+y+z/w is from 1 to 100 and a photoinitiator.

5,486,423

SiO_2 ELECTRETS AND PROCESS OF MAKING IT

Jacques Lewiner, 7 avenue de Suresnes, 92210 Saint-Cloud, and Didier Perino, 84 rue Voltaire, 92500 Rueil-Malmaison, both of, France

Filed Jan. 13, 1994, Ser. No. 182,707
Claims priority, application France, Jan. 14, 1993, 93 00297
Int. Cl.[6] B32B *15/04;* H05H *1/24*
U.S. Cl. 428—450 8 Claims



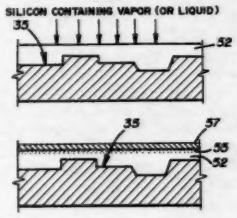
1. Process for making an electret which comprises the steps of forming a layer of SiO_2 on a solid substrate, by chemical vapor deposition in a vapor phase starting from a plasma containing silicon and oxygen, subjecting the layer so formed to a thermal treatment by raising its temperature to above 100° C. for a time period longer than 1 hour and then electrically charging said thermally treated layer.

5,486,424

SILYLATED PHOTORESIST LAYER AND PLANARIZING METHOD

Tatsuo Nakato, Vancouver, and David A. Vidusek, Camas, both of Wash., assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 893,702, Jun. 5, 1992, abandoned.
This application Feb. 4, 1994, Ser. No. 191,701
Int. Cl.[6] B32B *13/12*
U.S. Cl. 428—451 11 Claims



1. A silylated planarizing resist, the resist having a surface, comprising:

(a) an organic polymer capable of use in lithographic processes; and

b) an acid in a solution with the polymer, the solution forming a silicon-enriched portion adjacent to the surface of the resist,

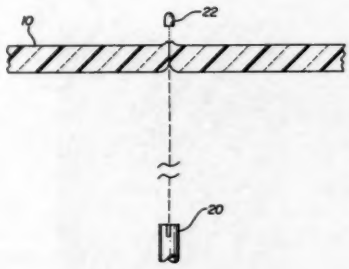
wherein the silicon-enriched portion is formed by reaction of an organosilane with the acid and wherein the resist is not photosensitive.

5,486,425

SHOOTING RANGE TARGET

George M. Seibert, 36591 Haverhill St., Sterling Heights, Mich. 48312

Continuation-in-part of Ser. No. 40,140, Mar. 30, 1993, Pat. No. 5,405,673. This application Oct. 22, 1993, Ser. No. 139,845
The portion of the term of this patent subsequent to Apr. 11, 2012, has been disclaimed.
Int. Cl.[6] B32B *3/10;* A63B *67/00;* F41H *5/02*
U.S. Cl. 428—500 10 Claims



1. A target for firearm projectiles including a body of an ionomeric material comprising a metallic salt of a copolymer of ethylene and a vinyl monomer having an acidic group, said body being operable, when penetrated by a bullet to first stretch and deform and then to form an opening therethrough which reseals after the bullet has passed and including a target support structure for retaining said body of ionomeric material.

5,486,426
COLD SEALABLE COHESIVE POLYMER COATED POLYOLEFIN SUBSTRATE

Dennis E. McGee, Penfield, and Robert E. Touhsaent, Fairport, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 131,500, Oct. 4, 1993. This application Nov. 28, 1994, Ser. No. 345,085

Int. Cl.[6] B32B *27/08;7/10*

U.S. Cl. 428—516 **13 Claims**

1. A coated polyolefin substrate which comprises a polyolefin film having a first side and a second side and a cold sealable, emulsion polymerized pressure sealable cohesive polymer composition for coating the first side of the substrate and an acrylic-based composition for coating the second side of the substrate, the polymer for coating the first side of the substrate comprising an acrylonitrile monomer and at least one of:

(a) a soft monomer selected from the group consisting of methyl acrylate, ethyl acrylate, hexyl acrylate, iso-octyl acrylate, butyl acrylate, isobutyl acrylate, isopropyl acrylate and vinyl acetate; and

(b) a monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, crotonic acid, sulfoethyl methacrylate and maleic acid;

the monomers being combined in weight percent amounts based on the total weight of the polymer sufficient to achieve a glass transition temperature of at least about −35° C., the weight percent amounts of the acrylonitrile monomer ranges from about 10 wt. % to about 65 wt. %, the weight percent amount of the (a) monomer ranges from about 30 wt. % to about 85 wt. % and the weight percent amount of the (b) monomer ranges from about 1 wt. % to about 3 wt. %, based on the total weight of the polymer, the polmer having low blocking tendencies to the acrylic-based formulation of the second side of the substrate.

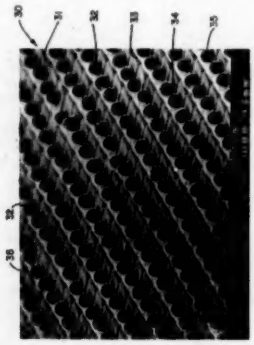
5,486,427
PATTERNED ARRAY OF UNIFORM METAL MICROBEADS

David C. Koskenmaki, St. Paul, and Clyde D. Calhoun, Grant Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 129,668, Sep. 30, 1993, Pat. No. 5,366,140. This application Aug. 19, 1994, Ser. No. 292,890

Int. Cl.[6] B22F *1/00;9/00*

U.S. Cl. 428—546 **13 Claims**



1. A regular array of discrete, uniform metal microspheres on a substrate, wherein said metal microspheres have a spherical portion, and a flat portion in contact with said substrate, and an average density on said substrate of about 600–6,000,000 beads/cm^2.

5,486,428
SOLID OXIDE FUEL CELL STACK

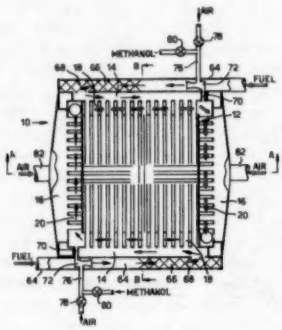
Frederick J. Gardner; Michael J. Day, both of Derby; Nigel P. Brandon, Leicestershire, and John B. Brownell, Derbyshire, all of, England, assignors to Rolls-Royce plc, London, United Kingdom

Filed Feb. 16, 1995, Ser. No. 392,544

Claims priority, application United Kingdom, Feb. 19, 1994, 9403198

Int. Cl.[6] H01M *8/10*

U.S. Cl. 429—19 **22 Claims**



1. A solid oxide fuel cell stack comprising

a plurality of solid oxide electrolyte members, each solid oxide electrolyte member having a first surface and a second oppositely facing surface, an anode electrode on the first surface of each solid oxide electrolyte member and a cathode electrode on the second opposite surface of each solid oxide electrolyte member to form a fuel cell, each anode electrode partially defining an anode chamber, each cathode electrode partially defining a cathode chamber,

means to define passages internally of the solid oxide fuel cell stack, the passages supplying hydrogen to the anode chambers, the passages containing a catalyst suitable for steam reforming hydrocarbon fuel to hydrogen and other product gases, the means to define the passages being in intimate thermal contact with the solid oxide fuel cells such that waste heat from the oxide fuel cells provides the endothermic heat requirements for the steam reforming reaction,

an adiabatic prereformer to convert heavier hydrocarbon fuels to methane, hydrogen and oxides of carbon and supplies the methane, hydrogen and oxides of carbon to the passages,

means to supply oxidant to the cathode chambers,

means to supply hydrocarbon fuel to the prereformer,

each first module comprising a first distribution member defining a plurality of first passages for the supply of a first reactant longitudinally relative to the first distribution member,

a plurality of electrolyte/electrode assemblies arranged to be carried on one side of the first distribution member, the electrolyte/electrode assemblies and the first distribution member, the electrolyte/electrode assemblies and the first distribution member defining a plurality of second passages therebetween, the second passages extending longitudinally relative to the first distribution member for the distribution of first reactant and the removal of spent first reactant,

each electrolyte/electrode assembly comprising a plurality of first electrodes, a plurality of solid oxide electrolyte members and a plurality of second electrodes,

each solid oxide electolyte member being positioned between and contacting a respective one of the first electrodes and a respective one of the second electrodes to form a fuel cell,

at least one interconnector to connect the first electrode of one fuel cell with the second electrode of an adjacent fuel cell.

the first electrodes on the electrolyte/electrode assembly facing the first distribution member,

each second module comprising a second distribution member defining a plurality of third passages for the supply of a second reactant longitudinally relative to the second distribution member,

the at least one first module being arranged in proximity to the at least one second module such that the electrolyte/electrode assemblies and the second distribution member define a plurality of fourth passage therebetween, the fourth passages extending longitudinally relative to the second distribution member for the distribution of second reactant and the removal of spent second reactant,

the second electrodes on the electrolyte/electrode assemblies facing the second distribution member,

one of the first and the third passages supplying hydrogen to one of the first and second electrodes respectively, one of the first and third passages respectively containing a catalyst suitable for steam reforming hydrocarbon fuel to hydrogen and other product gases, the first or second distribution members being in intimate thermal contact with the solid oxide fuel cells such that waste heat from the solid oxide fuel cells provides the endothermic heat requirements for the steam reforming reaction,

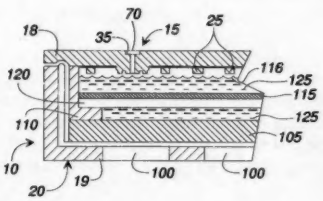
the prereformer supplying methane, hydrogen and oxides of carbon to one of the first and third passages.

5,486,429

DIFFUSION VENT FOR A RECHARGEABLE METAL-AIR CELL

William C. Thibault, Powder Springs, Ga., assignor to AER Energy Resources, Inc., Smyrna, Ga.

Filed Apr. 24, 1995, Ser. No. 428,005
Int. Cl.[6] H01M *2/12;12/06*
U.S. Cl. 429—27 **65 Claims**



1. A system for venting gas from within a case housing a metal-air cell having a cathode and an anode with a separator position therebetween, said case having an interior surface and an exterior surface, comprising:

at least one gas vent in said case on the anode side of said separator;

said gas vent extending from said interior surface of said case to said exterior surface of said case;

a gas vent cap covering each one of the said gas vents on said interior surface of said case; and

a gas permeable, hydrophobic membrane positioned between each pair of said gas vents and said gas vent caps;

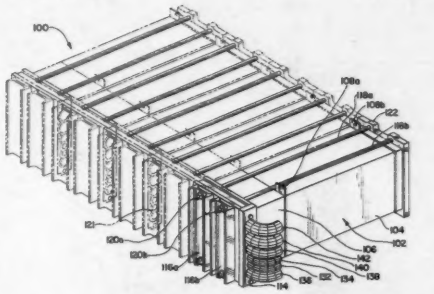
said gas vent cap being configured to prevent said anode from blocking the venting of gas through said membrane.

5,486,430

INTERNAL FLUID MANIFOLD ASSEMBLY FOR AN ELECTROCHEMICAL FUEL CELL STACK ARRAY

Brian N. Gorbell, North Vancouver; Beguslav M. Wozniczka, Coquitloun, and Clarence Y. Chow, Vancouver, all of, Canada, assignors to Ballard Power Systems Inc., North Vancouver, Canada

Filed Sep. 1, 1994, Ser. No. 299,536
Int. Cl.[6] H01M *8/04*
U.S. Cl. 429—35 **10 Claims**



1. A fluid manifold assembly for an array comprising a plurality of electrochemical fuel cell stacks, said fluid manifold assembly comprising:

(a) a substantially fluid impermeable housing;

(b) means within said housing for introducing at least one inlet fluid stream to each of said fuel cell stacks;

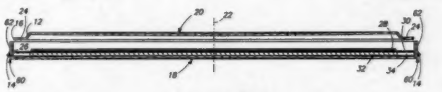
(c) means within said housing for exhausting at least one outlet fluid stream from each of said fuel cell stacks.

5,486,431

METHOD OF PRODUCING BUTTON-TYPE BATTERIES AND SPRING-BIASED CONCAVE BUTTON-TYPE BATTERY

John R. Tuttle, and Mark E. Tuttle, both of Boise, Id., assignors to Micron Communications, Inc., Boise, Id.

Filed Mar. 2, 1994, Ser. No. 206,051
Int. Cl.[6] H01M *2/04*
U.S. Cl. 429—66 **32 Claims**



1. A button-type battery comprising:

an anode;

a cathode positioned adjacent to the anode;

a separator and electrolyte between the anode and the cathode; a conductive first terminal housing member in electrical contact with one of the anode or the cathode, the first terminal housing member having a surrounding periphery and a concave central portion intermediate of its surrounding periphery;

a conductive second terminal housing member in electrical contact with the other of the anode or the cathode, the second terminal housing member having a surrounding periphery and a concave central portion intermediate of its surrounding periphery which is opposingly concave to the concave central portion of the first terminal housing member; and

the first and second terminal housing members being insulatingly joined and sealed at their respective peripheries to form an enclosed housing which retains and protects; the anode, cathode, separator and electrolyte, with the concave central portions of the first and second terminal housing members projecting inwardly toward one another forming opposing inwardly sprung conductive terminals compressively forcing the anode, separator and cathode together.

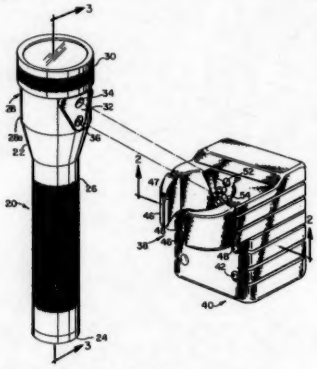
5,486,432
BATTERY ASSEMBLY

Raymond L. Sharrah, Collegeville, and Charles W. Craft, Lansdale, both of Pa., assignors to Streamlight, Inc., Norristown, Pa.

Continuation of Ser. No. 150,362, Nov. 9, 1993, abandoned, which is a division of Ser. No. 3,704, Jan. 13, 1993, Pat. No. 5,432,689. This application Jan. 11, 1995, Ser. No. 371,482

Int. Cl.[6] H01H *2/02*

U.S. Cl. 429—99 **30 Claims**



1. A battery assembly, comprising:

an elongated stack of cells, said stack having a first cell contact at one end and a second cell contact at the other end;

a holder sheath for holding said stack of cells together and exposing said first and second contacts;

a first central terminal connected to the first cell contact at said one end and centrally disposed at said one end;

a first conductive member in contact with said second cell contact;

a second terminal spaced from said first central terminal at said one end and insulated from said first terminal, said second terminal having an annular collar about the periphery of said one end of the stack; and

an elongated conductive member connecting said first conductive member with said second terminal, whereby positive and negative connection to said battery assembly is provided through said first and second terminals at said one end of said battery assembly.

5,486,433
BUTTON CELL

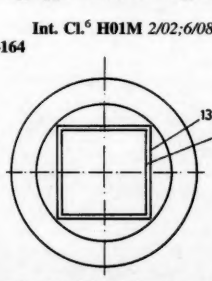
Helmut F. Glaser, Singapore, Singapore, assignor to Varta Batterie Aktiengesellschaft, Hanover, Germany

Filed Feb. 4, 1994, Ser. No. 191,955

Claims priority, application Germany, Feb. 24, 1993, 43 05 561.3

Int. Cl.[6] H01M *2/02;6/08*

U.S. Cl. 429—164 **19 Claims**



1. A button cell comprising at least one positive electrode, at least one negative electrode and an interposed separator arranged one on top of another in a flat gas-tight housing, a carrier strip associated with the positive electrode and the negative electrode, and an electrolyte, wherein the electrodes have a polygonal shape.

5,486,434
BATTERY TERMINAL

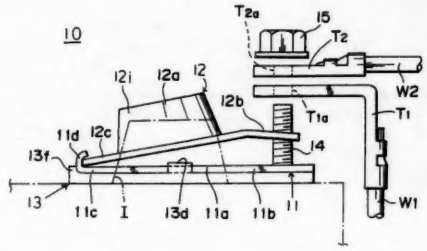
Masahiko Aoyama, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed May 9, 1994, Ser. No. 239,875

Claims priority, application Japan, May 25, 1993, 5-122923

Int. Cl.[6] H01M *2/30*

U.S. Cl. 429—178 **9 Claims**



1. A battery terminal for connecting a battery post to a cable, comprising:

(A) a substantially flat main member comprising:

a first post fitting portion having a first battery post fitting hole for receiving the battery post therein;

a ring support provided at a first side of the first post fitting portion;

a cable connector portion provided at a second side of the first post fitting portion; and

a stud bolt projecting vertically upward from said cable connector portion;

(B) a ring member placed over said main member, comprising:

a second post fitting portion having a second battery post fitting hole for receiving the battery post and a cone-shaped clamping piece projecting upward around an inside edge of the second battery post fitting hole;

a clamping member on one side of the second post fitting portion; and;

a cable connector portion with a bolt hole on an other side of the second post fitting portion through which said stud bolt is inserted, said cable connector portion being bent at a predetermined angle with respect to said second post fitting portion; and

(C) a nut mounted onto said stud bolt, whereby the battery terminal is assembled such that the end of the clamping member of the ring member is supported by the ring support of the main member, and the second post fitting portion and the cable connector portion of the ring member are inclined to the main member, and wherein tightening of the nut onto the stud bolt clamps the cable terminal to the ring member and simultaneously pushes the clamping piece of the ring member at an angle over the battery post and down against the battery post;

said main member and said ring member being constructed and

arranged such that said first battery post fitting hole is separately formed in and defined by said main member and said second battery post fitting hole is separately formed in and defined by said ring member.

5,486,435

ADDITIVES FOR EXTRUDING POLYMER ELECTROLYTES

Fernand Brochu, Longueuil, and Michel Duval, Montreal, both of, Canada, assignors to Hydro-Quebec, Montreal, Canada

Filed Jan. 25, 1994, Ser. No. 186,103
Int. Cl.[6] H01M *6/18*
U.S. Cl. 429—192 **8 Claims**

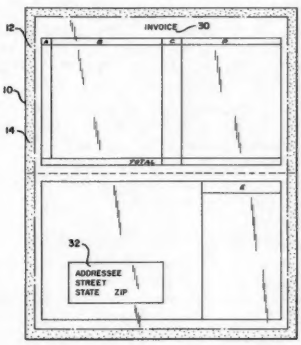
1. In a process for preparing an electrolyte film for lithium polymer electrolyte batteries, by extruding a powder mixture comprising an amorphous polymer and a lithium salt, the improvement comprising said powder mixture containing ultra-fine powder of a metal oxide with particle sizes between about 7 and 40 nm, which mixture is effective in preventing formation of adhesive solid blocks in the powder mixture and which allows said mixture to be introduced easily in an extruder.

5,486,436

SEALABLE WEB OR SHEET PRODUCT

A. Dale Lakes, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Oct. 15, 1993, Ser. No. 137,597
Int. Cl.[6] G03G *7/00;* **B32B** *3/00;7/06;7/14*
U.S. Cl. 430—11 **21 Claims**



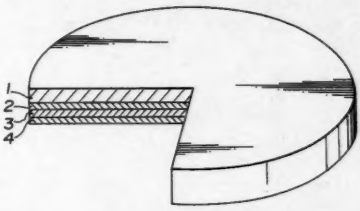
1. A web or sheet product comprising a substrate having two major surfaces, at least a portion of one or more peripheral edges of one major surface thereof coated with a bond-enabling material for adhering toner particles printed on said one or more peripheral edges on the surface of said sheet, said bond enabling material being resistant to melting or degrading when exposed to temperatures from about 250° F. to above 300° F. used for fusing toner images, and wherein said sheet is folded and sealed along at least one peripheral edge thereof which has been coated with said bond-enabling material and printed with said toner particles.

5,486,437

OPTICAL RECORDING METHOD

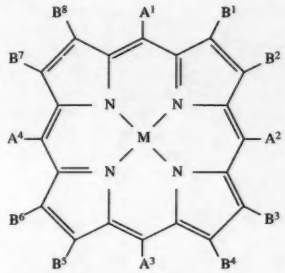
Takashi Iwamura; Yoko Matsuzawa, and Shin-Ichiro Tamura, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 226,046, Apr. 11, 1994, abandoned.
This application Jul. 24, 1995, Ser. No. 506,456
Claims priority, application Japan, Apr. 8, 1993, 5-082109
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—288 **4 Claims**



1. A method for high speed/high density recording of information on an optical recording medium and for high reliability, nondestructive playback of the recorded information therefrom, comprising the steps of:

providing an optical recording medium including a substrate having an optical recording layer thereon, the optical recording layer comprising an organic porphyrin dye having the formula:



where A^1 to A^4 and B^1 to B^8 indicate hydrogen, phenyl group, alkyl group or hydrocarbon compounds containing cyclo rings, or alternatively, B^n to B^{n+1} may be linked with C_6H_4 in a ring form, n being 1, 3, 5 or 7, and M denotes two to four protons or a metal atom,

and having a thickness dimension d, and having a complex index of refraction including a real part and an imaginary part and a reflective layer on said optical recording layer;

recording information on said optical recording medium by contacting the optical recording medium with blue-hued laser light having a first recording wavelength, λ_1, to provide an information carrying optical recording medium, which when reproduced on a compact disc reproducing apparatus has a modulation factor of 0.6 or higher; and

thereafter playing back information stored on the information carrying optical recording medium by contacting the information carrying optical recording medium with laser light having a second, higher, replay wavelength, λ_2, the optical recording layer being formed on the substrate so that the real part of the complex index of refraction in the replay light wavelength, λ_2, is 2.55 or higher and the absolute value of the imaginary part of the complex index of refraction at λ_2 is 0.1 or lower; and such that the absolute value of the imaginary part of the complex index of refraction at λ_1 is 1.0 or higher; and wherein the dimension d is less than or equal to 1.75 λ_2/n, wherein n is the real part of the complex index of refraction of the recording layer at λ_2.

5,486,438

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR

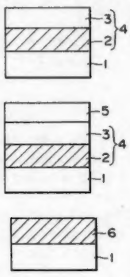
Masayuki Shoshi, Yokohama; Masakatsu Shimoda, Higashikurume; Akiko Konishi, Tokyo; Megumi Kawahara, Yokohama; Akio Kojima, Mitaka; Tetsuro Suzuki, and Masao Yoshikawa, both of Yokohama, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 18,445, Feb. 16, 1993, Pat. No. 5,350,653. This application Jun. 20, 1994, Ser. No. 262,271

Claims priority, application Japan, Mar. 2, 1992, 4-080487; May 20, 1992, 4-154548

Int. Cl.[6] G03G *5/09;5/047*

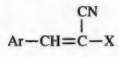
U.S. Cl. 430—58 **22 Claims**



1. An electrophotographic photoconductor, comprising:

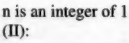
a) an electroconductive substrate;

b) a photoconductive layer formed thereon, comprising a charge generating material, and a vinylidene compound serving as a charge transporting material, which is selected from the group consisting of a vinylidene compound of the formula (I):



wherein Ar represents an aromatic group selected from the group consisting of pyrenyl, phenanthrenyl and anthracenyl, and said group substituted by amino, cyano, nitro, alkyl of 1 to 8 carbon atoms, halogen and alkoxycarbonyl of the formula:

wherein n is an integer of 1 to 8; and a vinylidene compound of the formula (II):



wherein Ar represents an aromatic group selected from the group consisting of pyrenyl, phenanthrenyl and anthracenyl, and said groups substituted by amino, cyano, nitro, alkyl of 1 to 8 carbon atoms, halogen and alkoxycarbonyl of the formula:

wherein n is an integer of 1 to 8, and R is an alkyl group having 1 to 8 carbon atoms, which are unattached or which form a ring in combination together.

12. The electrophotographic photoconductor as claimed in claim **1**, wherein said photoconductive layer comprises a charge generation layer comprising said charge generating material and a charge transport layer comprising said vinylidene compound serving as a charge transporting material, with one of said two layers being overlayed on the other.

5,486,439

ELECTROPHOTOGRAPHIC WITH POLYCARBONATE HAVING CHARGE TRANSPORTING GROUP

Teigo Sakakibara, Yokohama; Kiyoshi Sakai, Hachiohji; Toshihiro Kikuchi, Yokohama, and Akihiro Senoo, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1994, Ser. No. 193,470

Claims priority, application Japan, Feb. 9, 1993, 5-021192; Feb. 9, 1993, 5-021193; Feb. 9, 1993, 5-021194

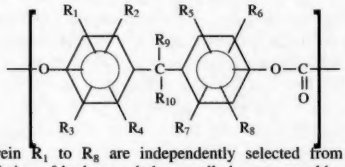
Int. Cl.[6] G03G *5/047;5/09*

U.S. Cl. 430—59 **9 Claims**

1. An electrophotographic photosensitive member, comprising:

a support and a photosensitive layer comprising a charge generation layer and a charge transport layer disposed on the support, said charge transport layer comprising a polycarbonate which has a charge-transporting group having a triphenylamine structure, a hydrazone structure or a biphenylamine structure at least in a side chain, wherein

said polycarbonate has a recurring unit represented by the following formula (A):



(A)

wherein R_1 to R_8 are independently selected from the group consisting of hydrogen, halogen, alkyl group capable of having a substituent, alkenyl group capable of having a substituent, alkoxy group capable of having a substituent and aryl group capable of having a substituent; and

one of R_9 and R_{10} is a group containing said charge transporting group and the other group R_9 or R_{10} is hydrogen, alkyl group capable of having a substituent, alkenyl group capable of having a substituent or aryl group capable of having a substituent; and both of R_9 and R_{10} can be a group containing said charge transporting group.

5,486,440

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, AND PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC APPARATUS EMPLOYING THE SAME

Yoshio Kashizaki; Hajime Miyazaki; Koichi Suzuki; Shintetsu Go, and Kazuma Sato, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

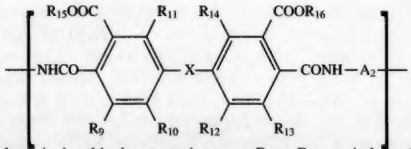
Filed Jun. 28, 1994, Ser. No. 266,687

Claims priority, application Japan, Jun. 30, 1993, 5-160882

Int. Cl.[6] G06G *5/14;15/08;15/00*

U.S. Cl. 430—62 **20 Claims**

1. An electrophotographic photosensitive member, comprising an electroconductive support, an interlayer formed on the electroconductive support, and a photosensitive layer formed on the interlayer, the interlayer containing a resin having a polyamic acid structure or a polyamic acid ester structure, wherein the resin has an amic acid structure or an amic acid ester structure of Formula (2):

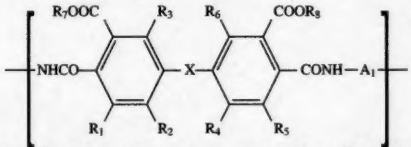


(2)

where A_2 is a bivalent organic group; R_9 to R_{14} are independently a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, or a cyano group; R_{15} and R_{16} are independently a hydrogen atom, a substi-

tuted or unsubstituted alkyl group, a substituted or unsubstituted alkoxyalkyl group, or a substituted or unsubstituted aralkyl group; and X is an oxygen atom, a substituted or unsubstituted alkylene group, a carbonyl group, or a sulfonyl group.

12. An electrophotographic photosensitive member, comprising an electroconductive support, an interlayer formed on the electroconductive support, and a photosensitive layer formed on the interlayer, the interlayer containing a resin having a polyamic acid structure or a polyamic acid ester structure of Formula (1)



(1)

where A_1 is a bivalent organic group; R_1 to R_6 are independently a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, or a cyano group; and R_7 and R_8 are independently a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxyalkyl group, or a substituted or unsubstituted aralkyl group;

wherein the interlayer is free of a conductive substance.

5,486,441

ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING 1,4-BIS(4,4-DIPHENYL-1,3-BUTADIENYL)BENZENE DERIVATIVE

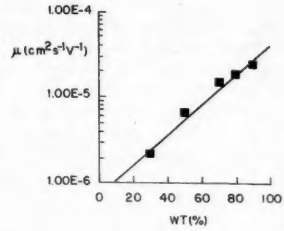
Yoshimasa Matsushima, and Toshimitsu Hagiwara, both of Kanagawa, Japan, assignors to Takasago International Corporation, Tokyo, Japan

Division of Ser. No. 233,434, Apr. 28, 1994. This application Apr. 27, 1995, Ser. No. 429,610

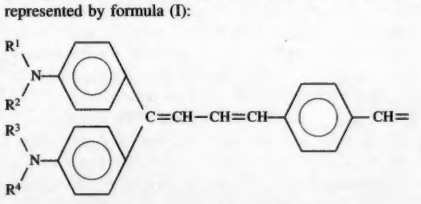
Claims priority, application Japan, Apr. 28, 1993, 5-123105

Int. Cl.[6] G03G *5/06; 5/09*

U.S. Cl. 430—74 **1 Claim**

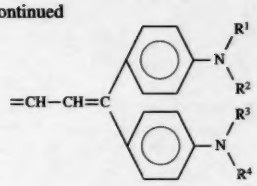


1. An electrophotographic photoreceptor comprising a charge transporting layer containing a charge transporting material comprising a 1,4-bis(4,4-diphenyl-1,3-butadienyl)benzene derivative represented by formula (I):



(I)

-continued



wherein R^1, R^2, R^3, and R^4, each independently represents a lower alkyl group which may be substituted, an aralkyl group which may be substituted, or an aryl group which may be substituted.

5,486,442

ORGANIC POLYMER AND PREPARATION AND USE IN CRYSTAL SPATIAL LIGHT MODULATOR

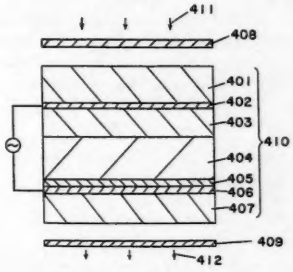
Akio Takimoto; Hirofumi Wakemoto, both of Neyagawa; Eiichiro Tanaka, Kishiwada; Masanori Watanabe, Katano; Junko Asayama, Suita; Hisahito Ogawa, Ikoma; Shigehiro Sato, Osaka, and Fumiko Yokotani, Suita, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 673,759, Mar. 25, 1991, abandoned. This application Jul. 13, 1993, Ser. No. 90,638

Claims priority, application Japan, Mar. 23, 1990, 2-73777; Mar. 23, 1990, 2-73778; Mar. 23, 1990, 2-73779; Mar. 25, 1990, 2-74971; Nov. 29, 1990, 2-335910

Int. Cl.[6] G03G *5/00*

U.S. Cl. 430—78 **5 Claims**



1. A liquid crystal spatial light modulator comprising a liquid crystal layer, a pair of photoconductive layers which sandwich said liquid crystal layer and a pair of conductive electrodes which sandwich said photoconductive layers, wherein said photoconductive layers are made of a polymer comprising repeating units of the formula:

$$—(X_i—Y_i)_n—$$

wherein n is a number of at least 1 (one), i is a positive integer not larger than n, X_i is an aromatic or substituted aromatic group, and Y_i is O, S, Se, Te or a divalent group: —CH=CH—.

5,486,443

MAGNETIC TONER COMPOSITIONS WITH SILICA, STRONTIUM TITANATE AND POLYVINYLIDENE FLUORIDE

Michael L. Grande, Palmyra; Bernard Grushkin, Pittsford; Eugene F. Young, Rochester; Douglas A. Lundy, and Joseph R. E. Matalevich, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1994, Ser. No. 331,444

Int. Cl.[6] G03G 9/09;9/083;9/097

U.S. Cl. 430—106 53 Claims

1. A toner consisting essentially of resin particles, magnetite pigment, carbon black pigment, rhodamine charge additive, wax, and a surface mixture of silica, strontium titanate and polyvinylidene fluoride; and wherein said resin particles are present in an amount of from about 50 to about 90 weight percent, said magnetite is present in an amount of from about 25 to about 40 percent, said carbon black is present in an amount of from about 1 to about 5 weight percent, said wax is present in an amount of from about 3 to about 15 weight percent, and said silica, strontium titanate and polyvinylidene fluoride are each present in an amount of from about 0.5 to about 2 weight percent.

5,486,444

POLYESTER PROCESSES FOR THE PREPARATION OF TONER

Robert D. Bayley, Fairport; Carol A. Fox, Farmington; Thomas R. Hoffend, Webster; James R. Paxson, Walworth, and Bernard Grushkin, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1994, Ser. No. 297,353

Int. Cl.[6] G03G 9/087

U.S. Cl. 430—109 32 Claims

1. A process for the preparation of toner which comprises mixing colorant and a crosslinked polyester obtained by the reaction of a diol or a mixture of diols and a diacid, a mixture of diacids or their diesters and a polyhydric alcohol monomer to provide a polyhydroxy functional polyester resin precursor, and subsequently reacting said polyhydroxy functional polyester precursor resin with a dianhydride or diepoxy functional crosslinking component.

5,486,445

TONER AND DEVELOPER COMPOSITIONS WITH DIBLOCK COMPATIBILIZERS

John G. Van Dusen, Walworth; Timothy J. Fuller, Pittsford, and Deborah M. Hudson, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 1, 1994, Ser. No. 283,427

Int. Cl.[6] G03G 9/097

U.S. Cl. 430—110 35 Claims

1. A toner composition consisting essentially of first resin particles, optional second crosslinked resin particles, pigment, wax component particles, and a compatibilizer comprised of a diblock polymer of partially hydrogenated polystyrene/polyisoprene or a partially hydrogenated polystyrene/polybutadiene.

5,486,446

MULTI-COLOR HEAT-SENSITIVE RECORDING MATERIAL UTILIZING MULTIPLE DIAZONIUM SALT LAYERS

Tetunori Matushita; Hiroshi Kamikawa; Hiroshi Satoh; Kimiatus Nomura, and Mitsuyuki Tsurumi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

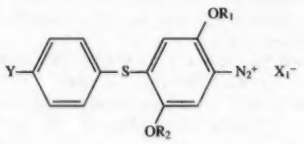
Filed Jun. 8, 1994, Ser. No. 257,055

Claims priority, application Japan, Jun. 10, 1993, 5-138599; Nov. 26, 1993, 5-297024

Int. Cl.[6] G03F 7/095

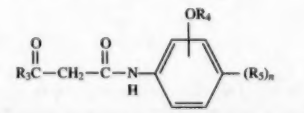
U.S. Cl. 430—156 4 Claims

1. A multi-color heat-sensitive recording material comprising a support having laminated thereon in the following order a first heat-sensitive color forming layer comprising mainly an electron donating dye precursor and an electron accepting compound, a second heat-sensitive color forming layer containing a first diazonium salt compound having a maximum absorption wavelength of 360±20 nm and a first coupler capable of reacting with the first diazonium salt compound by heating to form color and a third heat-sensitive color forming layer containing a second diazonium salt compound in an amount from 0.02 to 3 g/m^2 of the recording material represented by the following general formula (I) having a maximum absorption wavelength of 400±20 nm and a second coupler in an amount from 0.05 to 5 g/m^2 of the recording material represented by the following general formula (II) capable of reacting with the second diazonium salt compound by heating to form a color:



(I)

wherein R_1 and R_2, which may be the same or different, each represents an alkyl group, an aralkyl group or an aryl group, wherein R_1 and R_2 by be substituted with an alkyl group, an aryl group, a hydroxy group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an acyl group, an alkoxycarbonyl group, an acyloxy group, a carbamoyl group, an acylamino group, a cyano group or a halogen atom; Y represents a halogen atom, an acyl group, an alkoxycarbonyl group or a sulfamoyl group; and X_1^- represents a counter anion;



(II)

wherein R_3 represents an alkyl group or an aryl group; R_4

wherein R_3 represents an alkyl group or an aryl group; R_4 represents an alkyl group, an aryl group or an aralkyl group; R_5 represents an alkyl group, an alkoxy group, an aryloxy group, an aralkyloxy group, an alkylthio group, an arylthio group, an aralkylthio group or a halogen atom; wherein R_3, R_4 and R_5 may be substituted with an alkyl group, an aryl group, an alkoxy group, a cyano group, an ester group, an amide group, or a halogen atom; n represents 0 or an integer of 1 to 4, and when n is 2 or greater, the two or more R_5 groups may be the same or different; and the sum total of carbon atoms in R_4 and $(R_5)_n$ is at least 5.

5,486,447

NEGATIVE RESISTS WITH HIGH THERMAL STABILITY COMPRISING END CAPPED POLYBENZOXAZOLE AND BISAZIDE

Albert Hammerschmidt, Erlangen; Eberhard Kühn, Hemhofen, and Erwin Schmidt, Erlangen, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 672,940, Mar. 21, 1991, abandoned. This application Oct. 27, 1994, Ser. No. 330,227

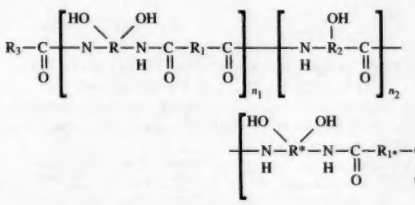
Claims priority, application Germany, Mar. 29, 1990, 40 10 125.8

The portion of the term of this patent subsequent to Dec. 27, 2011, has been disclaimed.

Int. Cl.[6] G03F *7/012;7/40*

U.S. Cl. 430—197 **6 Claims**

1. A negative resist comprising an admixture of a bisazide photoactive component and a polybenzoxazole precursor, wherein said polybenzoxazole precursor is a hydroxypolyamide having two terminal amino groups, each terminal amino group being end capped, the hydroxypolyamide also having the following structure:



where R, R*, R_1, R_1* and R_2 are aromatic groups and R_3 is an aromatic group or a norbornene residue, where R≠R* if R_1=R_1* and if n_1>0 and n_3>0, where R_1≠R_1* if R=R* and if n_1>0 and n_3>0, where $n_1+n_2+n_3 \geqq 3$, where n_1, n_2 and n_3 are selected from the group consisting of:

n_1=1 to 100, n_2 and n_3=0;

n_1 and n_2=1 to 100, n_3=0;

n_2=1 to 100, n_1 and n_3=0;

n_1, n_2 and n_3=1 to 100; and

n_1 and n_3=1 to 100, n_2=0, and wherein the mass ratio of hydroxypolyamide to bisazide is between about 1:20 and 20:1.

5,486,448

Patent Not Issued For This Number

5,486,449

PHOTOMASK, PHOTORESIST AND PHOTOLITHOGRAPHY FOR A MONOLITHIC IC

Hitoshi Hosono, and Satoru Takasugi, both of Kyoto, Japan, assignors to ROHM Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 476,534, Feb. 7, 1990, abandoned. This application Aug. 28, 1992, Ser. No. 935,345

Claims priority, application Japan, Feb. 7, 1989, 1-28496; Feb. 7, 1989, 1-28497; Feb. 14, 1989, 1-34338; Feb. 14, 1989, 1-34339; Feb. 20, 1989, 1-41069; Feb. 20, 1989, 1-41070; Feb. 23, 1989, 1-44713; Feb. 23, 1989, 1-44714; Feb. 23, 1989, 1-44715; Mar. 3, 1989, 1-52482

Int. Cl.[6] G03F *5/24*

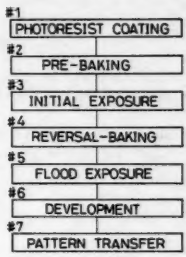
U.S. Cl. 430—328 **5 Claims**

1. A photolithographic method for manufacturing a semiconductor device comprising:

a step of applying photoresist onto a semiconductor substrate;

a step of pre-baking said photoresist;

a step of initially exposing said photoresist to light through a photomask, said photomask comprises a first part, a second part and a third part, each having different transparencies for exposing said photoresist, said first part being relatively opaque to said light, said second part being more transparent to said light than said first part, and said third part being more transparent to said light than said second part;



a step of reversal-baking said photoresist;

a step of flood-exposing said photoresist to light through another photomask positioned over an initially non-exposed region of the photoresist, said another photomask comprises a first part, a second part and a third part, each having different transparencies for exposing said photoresist, said first part being relatively opaque to said light, said second part being more transparent to said light than said first part, and said third part being more transparent to said light than said second part; and

a step of developing said photoresist to form an aperture therein, said aperture having a platform and an overhang formed in a wall of said aperture.

5,486,450

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL AND THE IMAGE-FORMING PROCESS THEREOF

Yasuo Tosaka, and Masayuki Sasagawa, both of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan

Division of Ser. No. 110,083, Aug. 20, 1993, Pat. No. 5,382,506. This application Oct. 11, 1994, Ser. No. 320,860

Claims priority, application Japan, Aug. 25, 1992, 4-226014

Int. Cl.[6] G03C *1/775*

U.S. Cl. 430—538 **12 Claims**

1. A silver halide color photographic light sensitive material comprising: a reflective support which is coated on both sides with a polyolefin resin, and provided on one side of the reflective support, a hydrophilic colloidal layer containing a white pigment and silver halide emulsion layers comprising a yellow image formable silver halide emulsion layer, a magenta image formable silver halide emulsion layer, a cyan image formable silver halide emulsion layer and a black image formable silver halide emulsion layer, said hydrophilic colloidal layer containing a white pigment being interposed between the support and all silver halide emulsion layers.

5,486,451

METHOD OF PREPARING SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Alberto Vacca, Carcare, and Paolo Barletta, Merana, both of, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 4, 1994, Ser. No. 285,938

Claims priority, application European Pat. Off., Sep. 23, 1993, 93115320

Int. Cl.[6] G03C *1/047;11/06*

U.S. Cl. 430—569 **14 Claims**

1. A method of preparing a washed silver halide photographic emulsion comprising the steps of forming a dispersion of silver halide grains in the presence of a hydrophilic colloid and removing

undesirable by-products of silver halide grain-formation by lowering the pH to bring about coagulation and by washing coagulum formed in dispersing silver halide grains, the method being characterized by the fact that said hydrophilic colloid comprises an acid-coagulable gelatin derivative and said coagulation is effected in the presence of an ionic copolymer comprising monomer units of:

(a) a water-soluble salt of a styrene sulfonic acid, and

(b) maleic acid, the molar ratio of (a) to (b) being at least 1:1 up to 9:1.

5,486,452

DEVICES AND KITS FOR IMMUNOLOGICAL ANALYSIS

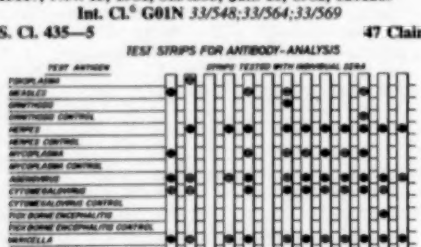
Julian Gordon, Arlesheim; Richard Hawkes, Allschwil, both of, Switzerland; Evelyn Niday, Arlington Heights, Ill., and Harry Towbin, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 912,144, Sep. 24, 1986, abandoned, which is a continuation of Ser. No. 673,211, Nov. 19, 1984, abandoned, which is a continuation of Ser. No. 345,440, Feb. 3, 1982, abandoned. This application Apr. 10, 1987, Ser. No. 38,470

Claims priority, application United Kingdom, Apr. 29, 1981, 8113167; Nov. 13, 1981, 8134353; Jan. 18, 1982, 8201289

Int. Cl.[6] G01N *33/548;33/564;33/569*

U.S. Cl. 435—5 **47 Claims**



1. An immunological analysis device consisting of a porous sheet of nitrocellulose containing an array of preselected geometry of delimited absorption areas of at least one compound capable of specifically binding an antigen (antigen-reactive compound) which adheres tightly and does not spread out on the surface of said porous sheet, said array of preselected geometry being obtained in said porous sheet by applying liquid aliquots of said antigen-reactive compound to said porous sheet mechanically via direct contact, wherein residual absorption sited in said porous sheet are unsaturated or saturated by non-specific protein.

5,486,453

ANTIBODIES TO HUMAN PAPILLOMAVIRUS LATENT PROTEINS, DIAGNOSTIC SYSTEMS AND METHODS

Joakim Dillner, Stockholm, Sweden; Richard A. Lerner, La Jolla, Calif.; Richard Smith, and D. Elliot Parks, Del Mar, both of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Division of Ser. No. 996,027, Dec. 23, 1992, Pat. No. 5,401,627, which is a division of Ser. No. 323,614, Mar. 13, 1989, Pat. No. 5,180,806, which is a continuation-in-part of Ser. No. 194,407, May 16, 1988, abandoned. This application Sep. 17, 1993, Ser. No. 123,465

Int. Cl.[6] C12Q *1/70*

U.S. Cl. 435—5 **52 Claims**

1. A method of assaying for the presence of a latent papillomavirus infection in a human subject, comprising the steps of:

a) obtaining a biological sample from said subject;

b) forming an immunoreaction admixture by admixing said sample with an agent that specifically binds one or more anti-papillomavirus latent protein antibodies present in said sample, said agent comprising one or more HPV type 6-related polypeptides of fewer than 35 amino acid residues in length, said one or more HPV type 6-related polypeptides including a sequence selected from the group consisting of HAIVTVTYDSE, and HKHAIVTVTYDSEEQRQQC;

c) maintaining said immunoreaction admixture under biological assay conditions for a time period sufficient for anti-papillomavirus latent protein antibodies present in said sample to specifically bind said agent to form an immunoreaction product; and

d) determining the presence of any immunoreaction product that formed, whereby the presence of immunoreaction product indicates the presence of a latent papillomavirus infection in said subject.

5,486,454

NUCLEIC ACID PROBE FOR THE DETECTION OF SALMONELLA HUMAN PATHOGENS

M. Jane Madonna, Middlesex, and Derek Woods, Flemington, both of N.J., assignors to Ortho Diagnostic Systems, Inc., New Brunswick, N.J.

Continuation of Ser. No. 26,256, Mar. 4, 1993, abandoned, which is a continuation of Ser. No. 672,743, Mar. 21, 1991, abandoned, which is a continuation of Ser. No. 309,441, Feb. 13, 1989, abandoned. This application May 17, 1994, Ser. No. 243,749

Int. Cl.[6] C12Q *1/68;* **C07H** *21/04*

U.S. Cl. 435—6 **22 Claims**

1. A synthetic nucleic acid probe for use in detecting nucleic acid from human pathogenic microorganisms from the genus Salmonella consisting of a nucleotide sequence selected from the group consisting of:

5' GCG TGC GGT AAA ACG CAG CGT ATT GGT GCC TTC AAC-3',

5' TAG TGC TAT TGT CCG CAG AGG AGA CAG CCA-3',

5' GCC GGT TGC GGT AGT GCT ATT GTC CGC AGA-3',

5' ACC CAG CGT CAC CGT TTG ATC GGC GGA TTT-3',

5' GTA TTG GTG CCT TCA ACC AGC GAC TGC TTC-3',

5'-ATT GCG AGT CTG ATG TTT G-3',

5'-TGC AGC CTG TGC CGT CAG C-3',

5'-TCT GCG GAC AAT AGC ACT A-3',

5'-GTT GAA GGC ACC AAT AC-3',

5'-TGC CGT TCC CTG ACG GGA-3',

5'-GCG TGC GGT AAA ACG CAG-3',

5'-CCC GAC GCC GGT TGC GG-3',

5'-GGC CGC CAC TTT CGG AT-3',

5'-GTT TGA TCG GCG GAT TT-3', and

5'-GCT CAC CGG ACT AGG ATC-3';

or a nucleotide sequence fully complementary thereto.

5,486,455

PHOTOPROTEIN CONJUGATES AND METHODS OF USE THEREOF

Nancy L. Stults, Duluth, Ga., assignor to SeaLite Sciences, Inc., Bogart, Ga.

Continuation of Ser. No. 17,116, Feb. 12, 1993, abandoned. This application Aug. 22, 1994, Ser. No. 293,648

Int. Cl.[6] C12Q *1/70;1/68;* **G01N** *33/53;* **C07H** *19/04*

U.S. Cl. 435—6 **1 Claim**

1. A photoprotein-binding reagent conjugate composition comprising,

a sulfhydryl-activated aequorin coupled to a sulfhydryl-reactive binding reagent capable of binding specifically to an analyte, to form a conjugate capable of producing light in a lumines-

cent reaction, wherein said aequorin is sulfhydryl-activated by 2-imithiolane (Traut's reagent), and said binding reagent is made sulfhydryl-reactive by succinimidyl 4-(N-maleimidomethyl)cyclohexane, (SMCC).

5,486,456

METHOD OF DIAGNOSING OVARIAN, ENDOMETRIAL, AND COLON CANCERS WITH MONOCLONAL ANTIBODIES OXA AND OXB

Feng J. Xu; Yin H. Yu, both of Durham, and Robert C. Bast, Jr., Chapel Hill, all of N.C., assignors to Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 879,860, May 6, 1992, Pat. No. 5,366,866, which is a continuation-in-part of Ser. No. 735,513, Jul. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 735,601, Jul. 25, 1991, abandoned. This application Mar. 23, 1994, Ser. No. 216,616

Int. Cl.[6] G01N *33/574;33/53;* **C07K** *16/30*

U.S. Cl. 435—7.23 **19 Claims**

1. A method of screening for the presence of cancer in a human subject, the cancer selected from the group consisting of ovarian, breast, endometrial and colon Cancer, comprising:

contacting a sample comprising a biological fluid taken from said subject with an antibody selected from the group consisting of monoclonal antibody OXA, monoclonal antibody OXB, antibodies which specifically bind the epitope bound by monoclonal antibody OXA or OXB, and fragments thereof which specifically bind the epitope bound by monoclonal antibody OXA or OXB, under conditions permitting said antibody to specifically bind an antigen in the sample to form an antibody-antigen complex; and then

determining the amount of antibody-antigen complex in the sample as a measure of the amount of antigen in the sample, wherein an elevated level of the antigen in the sample is associated with the presence of ovarian, breast, endometrial or colon cancer.

5,486,457

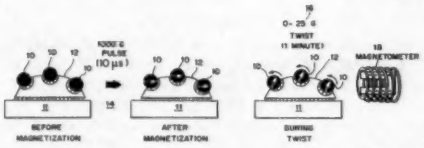
METHOD AND SYSTEM FOR MEASUREMENT OF MECHANICAL PROPERTIES OF MOLECULES AND CELLS

James P. Butler, Brookline; Jeffrey J. Fredberg, Sharon; Donald E. Ingber, Boston, and Ning Wang, Brookline, all of Mass., assignors to Children's Medical Center Corporation, Boston, and President and Fellows of Harvard College, Cambridge, both of Mass.

Filed Aug. 25, 1993, Ser. No. 112,757

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.2 **21 Claims**



8. An in vitro method for detecting the effect of mechanical stimulation of molecules immobilized on a surface comprising:

mixing ferromagnetic microbeads having coated thereon attachment molecules which bind to the molecules immobilized on a surface, wherein the attachment molecules are selected from the group consisting of matrix molecules that bind to integrins and molecules that bind to other receptors that span the cell surface and physically interconnect with distinct cytoskeletal proteins, the microbeads having a diameter between 0.03 and 500 microns, with the molecules immobilized on a substrate;

treating the mixture of the microbeads and the immobilized molecules with a compound which is to be tested for an effect on the interaction of the attachment molecules on the microbeads with the immobilized molecules;

imposing on the microbeads a strong external magnetic field resulting in magnetization and alignment of the magnetic moments of the microbeads;

imposing on the microbeads defined mechanical stresses between zero and 300 dyne/cm^2 using a weaker "twisting" magnetic field applied perpendicular to the original field;

measuring the component of the remanent magnetic field vector in the direction of the original magnetization as a function of time;

comparing the effect of the compound to be tested on the interaction of the immobilized molecules with the attachment molecules on the microbeads with the effect of a compound having a predetermined effect on the interaction of the immobilized molecules with the attachment molecules on the microbeads.

5,486,458

METHOD OF QUANTITATIVE ASSAY FOR 1,5-ANHYDROGLUCITOL

Ryo Kojima; Yoshiro Sato, both of Koriyama, and Takeshi Nagasawa, Urawa, all of, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Jun. 30, 1993, Ser. No. 85,317

Claims priority, application Japan, Jun. 30, 1992, 4-172955

Int. Cl.[6] C12Q *1/54;* **C12N** *1/00*

U.S. Cl. 435—14 **7 Claims**

1. In a method for the quantitative assay of 1,5-anhydroglucitol in a specimen derived from human blood, blood serum or blood plasma, wherein maltose in the specimen is converted into glucose by the action of α-glucosidase derived from a microorganism belonging to the genus Bacillus in a first step; said glucose is phosphorylated with a phosphorylating enzyme to selectively remove the glucose and sugars other than 1,5-anhydroglucitol present in the specimen in a second step; and 1,5-anhydroglucitol in the specimen is reacted with a pyranose oxidase in a third step; the improvement of:

performing the three steps in a single reaction zone, at a pH range of from 7.2 to 8.5, at a temperature of from about 5° to 40° C. over a period of from about 2 to 30 minutes, said second step taking place in the presence of an excess amount of adenosine-5'-triphosphate.

5,486,459

BIOLOGICALLY RELEVANT METHODS FOR THE RAPID DETERMINATION OF STERILITY

Jeffrey C. Burnham; George J. Hageage; Douglas Jambard-Sweet, all of Maumee, and Judy Hendricks, Findlay, all of Ohio, assignors to Medical College of Ohio, Toledo, Ohio

Continuation of Ser. No. 126,197, Sep. 24, 1993, abandoned, which is a continuation-in-part of Ser. No. 970,307, Nov. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 859,066, Mar. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 450,394, Dec. 14, 1989, abandoned. This application Jan. 30, 1995, Ser. No. 380,195

Int. Cl.[6] C12Q *1/22;* **G01N** *21/00*

U.S. Cl. 435—31 **29 Claims**

1. A biological process for determining the effectiveness of a sterilization procedure comprising the steps of:

a) placing a test indicator containing one or more components, but not all of the components of a plurality of interactive enzyme systems into a sterilization chamber;

b) performing the sterilization procedure within the chamber;

c) adding the remaining components of the plurality of interactive enzyme systems to the one or more components in the test indicator to form a mixture;

d) incubating the mixture for a period of time; and

e) detecting presence or absence of a detectable product to determine the effectiveness of the sterilization procedure.

5,486,460

METHOD AND TEST KITS FOR IDENTIFYING ALZHEIMER'S DISEASE BY TESTING CEREBROSPINAL FLUID

Laurace E. Townsend, Grosse Pointe Pk., Mich., assignor to Wayne State University, Detroit, Mich.

Continuation of Ser. No. 918,943, Jul. 22, 1992, abandoned, which is a continuation of Ser. No. 32,319, Mar. 30, 1987, abandoned. This application May 20, 1993, Ser. No. 64,346

Int. Cl.[6] G01N *1/30;33/48*

U.S. Cl. 435—40.51 **15 Claims**

1. A method for aiding in the diagnosis of Alzheimer's disease after a clinical diagnosis of Alzheimer's type dementia in a living or decreased human the steps which comprise:

(a) providing a sample of cerebrospinal fluid (CSF) suspected of containing amyloid particles from the living or decreased human;

(b) concentrating the CSF sample, to produce a concentrate of said particles;

(c) applying a unit of the liquid concentrate with said particles a on a surface;

(d) drying the concentrate and applying an adhesive so as to bind said particles to the surface;

(e) staining said particles in the dried concentrate on the surface with a stain which is visible with light from and external light source, where the stain is a thiazine stain which stains said particles; and

(f) rinsing excess, non-adherent stain with a solvent which dissolves the excess stain;

(g) counting said particles on the surface by means of said stain, wherein the human with the clinical diagnosis of the Alzheimer's Disease exhibits a higher number of the particles per unit volume of CSF than humans without Alzheimer's Disease and above about 20 particles per 80 microliters of CSF as shown in FIG. 1 with the thioflavin stain.

5,486,461

CASEIN HYDROLYZATE AND METHOD FOR PRODUCTION OF SUCH CASEIN HYDROLYZATE

Per M. Nielsen, Hillerod, Denmark, assignor to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK92/00326, § 371 Date Apr. 13, 1994, § 102(e) Date Apr. 13, 1994, PCT Pub. No. WO93/08702, PCT Pub. Date May 13, 1993

PCT Filed Sep. 9, 1992, Ser. No. 211,689

Claims priority, application European Pat. Off., Nov. 8, 1991, 91610088; Nov. 27, 1991, 91610091; Denmark, May 27, 1992, 711/92

Int. Cl.[6] A23J *3/34;3/10;1/20*

U.S. Cl. 435—68.1 **13 Claims**

1. A method for production of a casein hydrolyzate, comprising

a. suspending or dissolving a rennet precipitated or acid precipitated casein or caseinate with at least 85% of protein calculated as dry matter in an aqueous medium to a solution with a protein content up to about 20%,

b. hydrolyzing the suspension/solution in a one step reaction to a degree of hydrolysis of 15–35% by means of three groups of proteases which are

i. one or more neutral endoproteases from a Bacillus in a concentration of at least 0.005 Anson units/100 g of protein,

ii. one or more alkaline endoproteases from a Bacillus in a concentration of at least 0.005 Anson units/100 g of protein, and

iii. one or more exoproteases from an Aspergillus in a concentration corresponding to at least 1000 peptidase units/100 g of protein, at a temperature between 45° C. and 60° C. without any p.H. adjustment;

c. terminating the hydrolysis by inactivation of the enzymes to form an effluent; and

d. converting the effluent to a dry state;

wherein the casein hydrolyzate is completely soluble or at least 99% soluble in an aqueous medium with a pH value in the pH range of 3.5–7.0, is of good organoleptic quality, and contains peptides in relative amounts corresponding to the following MW distribution:

	weight-%
MW > 5000	0–1
5000 > MW > 1500	15–35
1500 > MW > 500	40–60
500 > MW	15–35

wherein the casein hydrolyzate does not contain any unhydrolyzed casein and contains free amino acids in an amount less than 10% and that the number average molecular weight (Mn) is 400–650.

5,486,462

DIFFERENTIATIVE EXPRESSION MODULES

William J. Rutter; Michael D. Wlaker, both of San Francisco, Calif.; Thomas Edlund, Umeå , Sweden, and Anne M. Boulet, San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 768,345, Sep. 30, 1991, abandoned, which is a continuation of Ser. No. 327,366, Mar. 22, 1989, abandoned, which is a continuation of Ser. No. 196,781, May 18, 1988, abandoned, which is a continuation of Ser. No. 674,225, Nov. 23, 1984, abandoned. This application Jun. 17, 1992, Ser. No. 900,512

Int. Cl.[6] C12N *5/06;15/11;15/17;15/67*

U.S. Cl. 435—69.1 **12 Claims**

1. A mammalian tissue-specific DNA fragment comprising a heterologous DNA molecule encoding a gene of interest; and

a tissue-specific transcription-enhancing DNA segment isolated from an insulin gene, wherein said segment is contained within a 5' flanking region located −1 to about −300 bases upstream of the transcription initiation site of the insulin gene, said transcription-enhancing DNA segment being positioned within about 2 kb of the heterologous DNA molecule and operatively linked upstream to a DNA promoter segment, said promoter segment being positioned upstream of and operatively linked to the heterologous DNA molecule,

whereby when the tissue-specific DNA fragment is placed in an insulin-producing cell, expression of the heterologous protein is enhanced relative to the level of expression in a differentiated cell of a different tissue type.

5,486,463

TNF-MUTEINS

Werner Lesslauer, Riehen; Hansruedi Lötscher, Mölin, both of, Switzerland, and Dietrich Stüber, Grenzach-Wyhlen, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 1, 1993, Ser. No. 41,648

Claims priority, application European Pat. Off., Apr. 2, 1992, 92810249

Int. Cl.[6] C12P *21/06;* **C07H** *17/00;* **C07K** *14/00;* **C12N** *1/20*

U.S. Cl. 435—69.5 **27 Claims**

1. A human Tumor Necrosis Factor a mutein having selective binding affinity for the p55 subunit of human Tumor Necrosis Factor Receptor, said mutein comprising the sequence of human Tumor Necrosis Factor wherein at least one amino acid in said sequence is substituted, one of said substitutions being at position 86, wherein Thr is substituted for Ser, and said mutein having selective binding affinity for said p55 subunit of said human Tumor Necrosis Factor receptor, or a pharmaceutically acceptable salt thereof.

5,486,464

Patent Not Issued For This Number

5,486,465

TEICOPLANIN RECOVERY PROCESS

Anacleto Giantonio, Milan, and Gianbattista Panzone, Cornaredo, both of, Italy, assignors to Gruppo Lepetit S.p.A., Gerenzano, Italy

Continuation of Ser. No. 317,422, Oct. 4, 1994, abandoned, which is a continuation of Ser. No. 196,889, Feb. 15, 1994, abandoned, which is a continuation of Ser. No. 34,007, Mar. 19, 1993, abandoned, which is a continuation of Ser. No. 764,658, Sep. 24, 1991, abandoned. This application Mar. 29, 1995, Ser. No. 413,971

Claims priority, application European Pat. Off., Jan. 1, 1990, 90118778

Int. Cl.[6] C07K *14/365*

U.S. Cl. 435—70.1 **5 Claims**

1. A process for recovering teicoplanin A_2 from a whole culture fermentation broth, containing a mycelial mass produced by the fermentation of *Actinoplanes teichomyceticus* ATCC 31121, which comprises:

a) separating the fermentation broth from the mycelial mass by filtration;

b) raising the pH of the whole culture fermentation broth to a level greater than 10, but less than 12, prior to initiating said filtration and maintaining this pH range while said filtration is carried out;

c) maintaining the temperature of the whole culture fermentation broth at a temperature no greater than room temperature while said filtration is carried out and;

d) recovering said teicoplanin A_2 from the filtered fermentation broth.

5,486,466

PROCESS FOR THE PREPARATION OF DNA GYRASE INHIBITORS

Mikio Arisawa, Kamakura, Japan; Erwin Götschi; Paul Hebeisen, both of Reinach, Switzerland; Tsutomu Kamiyama, Yokohama, Japan; Helmut Link; Raffaello Masciadri, both of Basel, Switzerland; Hisao Shimada, Fujisawa, and Junko Watanabe, Yokohama, both of, Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 177,483, Jan. 6, 1994, Pat. No. 5,399,741, which is a division of Ser. No. 952,537, Dec. 9, 1992, Pat. No. 5,294,609. This application Nov. 14, 1994, Ser. No. 339,442

Claims priority, application European Pat. Off., Apr. 17, 1991, 91106105

Int. Cl.[6] C12P *13/04;* **C12N** *1/20*

U.S. Cl. 435—106 **2 Claims**

1. Process for the manufacture of N-[[(4R,7S)-1,3,4,5,6,7,8,10-octahydro-12,14-dihydroxy-7-[[(3R)-3-hydroxy- 1-L-seryl-L-prolyl]amino]-11-methyl-6,10-dioxo- 9,2,5-benzoxathiaazacyclododecin-4-yl]carbonyl}-L-alanine and of pharmaceutically acceptable salts thereof, which comprises cultivating a subculture of the microorganism Streptomyces sp. NR0484 FERM-BP-1982 under submerged, aerobic conditions in an aqueous carbohydrate solution containing nitrogenous nutrients and sodium choride, thereafter isolating the desired compound from the fermentation broth and, if desired. converting the product obtained into a pharmaceutically acceptable salt thereof.

5,486,467

CATALASE FROM *BACILLUS SUBTILIS* IAM 1026 (FERM BP-4844)

Yuichi Fusho, Kanagawa, and Yoshihiro Yajima, Chiba, both of, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 354,721

Claims priority, application Japan, Jan. 18, 1994, 6-003698; Apr. 25, 1994, 6-086745

Int. Cl.[6] C12N *9/08;1/20;1/00*

U.S. Cl. 435—192 **2 Claims**

1. An isolated catalase obtainable from *Bacillus subtilis* IAM 1026 (FERM BP 4844) or a mutant strain thereof having a catalase activity at 0° C. of 95% or more of its catalase activity at 30° C., when measured at pH 7 and wherein said catalase has:

(1) an operative temperature of 0° to 60° C. and an optimum temperature of 0° to 30° C.,

(2) an optimum pH of 7 to 10,

(3) a resistance to 10 mM potassium fluoride,

(4) a molecular weight of 65,000±3,000, when measured by SDS polyacrylamide gel electrophoresis, and

(5) an isoelectric point of about 4.8, when measured by isoelectric focusing.

5,486,468

THERMOSTABLE ENDOXYLANASES

Jutta Casimir-Schenkel, Zurich; Armin Fiechter, Rudolfstetten, both of, Switzerland; Beat Gysin, Harrogate, Great Britain, and Wolfgang Zimmermann, Watt, Switzerland, assignors to Clariant Finance (BVI) Limited, Virgin Islands (Br.)

Division of Ser. No. 747,768, Aug. 20, 1991, Pat. No. 5,407,827. This application Aug. 17, 1994, Ser. No. 292,147

Claims priority, application United Kingdom, Aug. 22, 1990, 9018426

Int. Cl.[6] C12N *9/24;9/42*

U.S. Cl. 435—200 **4 Claims**

1. A biologically pure culture of a strain of *Thermomonospora fusca* possessing all the identifying characteristics of the strain with the designation KW3 and deposition number DSM 6013.

5,486,469

THERMOSTABLE FERVIDOBACTERIUM PULLULANASES

Garabed Antranikian, Seevetal, Germany, and Per L. Jørgensen, Copenhagen, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK92/00079, § 371 Date Aug. 3, 1993, § 102(e) Date Aug. 3, 1993, PCT Pub. No. WO92/16617, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 13, 1992, Ser. No. 94,204

Claims priority, application Denmark, Mar. 15, 1991, 472/91

Int. Cl.[6] C12N *9/44;15/56;15/70;15/74*

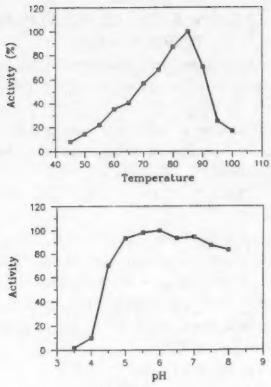
U.S. Cl. 435—210 **8 Claims**

1. An isolated pullulanase endogenous to the strain *Fervidobacterium sp.* Ven 5, DSM 6204, or a mutant thereof which is capable of producing the pullulanase having:

(a) a temperature optimum in the range 80°–90° C.;

(b) a pH optimum in the range of 5–7; and

(c) at least 60% residual activity after 24 hours of incubation at pH 6.0.



5,486,470

PURIFIED HERPES SIMPLEX VIRUS PROTEASE AND METHODS OF PURIFICATION

Paul L. Darke, Blue Bell; Dawn L. Hall, Spring City, and Lawrence C. Kuo, Solebury, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 21, 1994, Ser. No. 279,754
Int. Cl.[6] C12N *9/50*
U.S. Cl. 435—219 17 Claims

1. A method for producing Herpes Simplex Virus 1 or 2 protease comprising the steps of:

a) separating precursor viral protease from non-protease constituents of a host cell using cation exchange chromatography; and

b) subjecting the separated precursor protease to autoprocessing conditions to obtain mature protease.

5,486,471

TISSUE PLASMINOGEN ACTIVATOR ANALOGS HAVING MODIFIED GROWTH FACTOR DOMAINS

Eileen R. Mulvihill, Seattle, Wash.; Shinji Yoshitake, Ibaraki, Japan; Yasunori Ikeda, Ibaraki, Japan; Suguru Suzuki, Ibaraki, Japan; Akira Hashimoto, Ibaraki, Japan; Teruaki Yuzuriha, Ibaraki, Japan, and Bjorn A. Nexo, Søborg, Denmark, assignors to ZymoGenetics, Inc., Seattle, Wash.

Continuation of Ser. No. 171,761, Dec. 22, 1993, abandoned, which is a continuation of Ser. No. 845,736, Mar. 2, 1992, abandoned, which is a continuation of Ser. No. 58,061, Jun. 4, 1987, abandoned. This application Mar. 6, 1995, Ser. No. 400,136
Int. Cl.[6] C12N *9/64;1/21;5/10;* A61K *38/49*
U.S. Cl. 435—226 12 Claims

1. A human t-PA having a cysteine residue within the growth factor domain at position No. 84 of native t-PA replaced with either serine or alanine.

5,486,472

MONOCLONAL ANTIBODIES TO PACAP

Nobuhiro Suzuki, Ibaraki; Chieko Kitada, Osaka, and Masao Tsuda, Ibaraki, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP91/00354, § 371 Date Sep. 3, 1992, § 102(e) Date Sep. 3, 1992, PCT Pub. No. WO91/14786, PCT Pub. Date Oct. 3, 1991
PCT Filed Mar. 15, 1991, Ser. No. 924,054
Claims priority, application Japan, Mar. 17, 1990, 2-5565; Jan. 26, 1990, 2-287115
Int. Cl.[6] C12N *5/12;* C07K *16/18;* G01N *33/53*
U.S. Cl. 435—240.27 11 Claims

11. A polyclonal antibody which specifically binds to a C-terminal peptide of PACAP27 represented by SEQ ID NO:7.

5,486,473

A DNA CODING FOR A FLAVIVIRUS ANTIGEN

Hiroyuki Fujita, Mitoyo; Iwao Yoshida, Kanonzi; Mitsuo Takagi; Sadao Manabe, both of Mitoyo, and Konosuke Fukai, Toyonaka, all of, Japan, assignors to The Research Foundation for Microbial Diseases of Osaka University, Osaka, Japan

Continuation of Ser. No. 809,255, Dec. 18, 1991, abandoned, which is a continuation of Ser. No. 279,685, Dec. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 932,419, Nov. 19, 1986, Pat. No. 4,810,492. This application Feb. 9, 1994, Ser. No. 194,049
Claims priority, application Japan, May 6, 1986, 61-131208
Int. Cl.[6] C12N *5/10;1/21;15/40;15/70*
U.S. Cl. 435—240.2 5 Claims

1. An isolated deoxyribonucleic acid which comprises a nucleotide sequence selected from the group consisting of a nucleotide sequence represented by the following formula (II) and the complementary nucleotide sequence to said nucleotide sequence of the formula (II):

TTT AAT TGT CTG GGA ATG GGC AAT CGT GAC
TTC ATA GAA GGA GCC AGT GGA GCC ACT TGG
GTG GAC TTG GTG CTA GAA GGA GAT AGC TGC
TTG ACA ATC ATG GCA AAC GAC AAA CCA ACA
TTG GAC GTC CGC ATG ATT AAC ATC GAA GCT
AGC CAA CTT GCT GAG GTC AGA AGT TAC TGC
TAT CAT GCT TCA GTC ACT GAC ATC TCG ACG
GTG GCT CGG TGC CCC ACG ACT GGA GAA GCT
CAC AAC GAG AAG CGA GCT GAT AGT AGC TAT
GTG TGC AAA CAA GGC TTC ACT GAT CGT GGG
TGG GGC AAC GGA TGT GGA CTT TTC GGG AAG
GGA AGC ATT GAC ACA TGT GCA AAA TTC TCC
TGC ACC AGC AAA GCG ATT GGA AGA ACA ATC
CAG CCA GAA AAC ATC AAA TAC GAA GTT GCC
ATT TTT GTG CAT GGA ACC ACC ACT TCG GAA
AAC CAT GGG AAT TAT TCA GCG CAA GTT GGG
GCG TCC CAG GCG GCA AAG TTT ACA ATA ACA
CCC AAT CGT CCT TCG ATA ACC CTC GGG CTT
GGT GAC TAC GGA GAA GTC ACG CTG GAC TGT
GAG CCA AGG AGT GGA CTG AAC ACT GAA GCG
TTT TAC GTC ATG ACC GTG GGG TCA AAG TCA
TTT CTG GTC CAT AGG GAA TGG TTT CAT GAC
CTC GCT CTC CCC TGG ACG TCC CCT TCG AGC
ACA GCG TGC AGA AAC AGA GAA CTC CTC ATG
GAA TTT GAA GAG GCG CAC GCC ACA AAA CAG
TCC GTT GTT GCT CTT GGG TCA CAG GAA GGA
GGC CTC CAT CAG GCG TTG GCA GGA GCC ATC
GTG GTG GAG TAC TCA AGC TCA GTG AAG TTA
ACA TCA GGC CAC CTG AAA TGT AGG ATG AAA
ATG GAC AAA CTG GCT CTG AAA GGC ACA ACC
TAT GGC ATG TGT ACA GAA AAA TTC TCG TTC
GCG AAA AAT CCG GCG GAC ACT GGC CAC GGA
ACA GTT GTC ATT GAA CTA TCC TAC TCT GGG
AGT GAT GGC CCC TGC AAA ATT CCG ATT GTC
TCC GTT GCG AGC CTC AAT GAC ATG ACC CCC
GTT GGG CGG CTG GTG ACA GTG AAC CCT TTC
GTC GCG ACT TCC AGT GCC AAC TCA AAG CTG

-continued

CTG GTC GAG ATG GAA CCC CCC TTC GGA GAC
TCC TAC ATC GTG GTT GGG AGG GGA GAC AAG
CAG ATC AAC CAC CAT TGG CAC AAA GCT GGA
AGC ACG CTA GGC AAG GCC TTT TCA ACA ACT
TTG AAG GGA GCT CAA AGA CTG GCA GCG TTG
GGC GAC ACA GCC TGG GAC TTT GGC TCC ATT
GGA GGG GTC TTC AAC TCC ATA GGA AAA GCC
GTT CAC CAA GTG TTT GGT GGT GCC TTC AGA
ACA CTC TTT GGG GGA ATG TCT TGG ATC ACA
CAA GGG CTA ATG GGT GCC CTA CTA CTC TGG
ATG GGC GTC AAC GCA CGA GAC CGA TCA ATT
GCT TTG GCC TTC TTA GCC ACA GGA GGT GTG
CTC GTG TTC TTA GCG ACC AAT GTG CAT GCT
..... (II)

wherein A represents a deoxyadenylic acid residue, G a deoxyguanylic acid residue, C a deoxycytidylic acid residue and T a deoxythymidylic acid residue, and the left and right ends of formula (II) represent the 5'-terminus and 3'-terminus, respectively, or a variant of said deoxyribonucleic acid which is obtained by modifying said .nucleotide sequences of the formula (II) in accordance with the degeneracy of the Genetic Code.

5,486,474

BIOREMEDIATION METHOD USING A HIGH NITROGEN-CONTAINING CULTURE OF WHITE ROT FUNGI ON SUGAR BEET PULP

Clifford A. Bradley; Robert D. Kearns; Pauline P. Wood, and William E. Black, all of Butte, Mont., assignors to Mycotech Corporation, Butte, Mont.

Continuation of Ser. No. 649,438, Feb. 1, 1991, abandoned. This application Jan. 11, 1993, Ser. No. 3,836

Int. Cl.[6] **C02F** *1/00;3/00;* **C12N** *1/22;* **C07C** *7/00*

U.S. Cl. 435—262 **14 Claims**

1. A bioremediation method for degrading at least one aromatic compound in soil or water, comprising:

a. combining a white-rot fungus and a sugar beet pulp substrate in a high nitrogen fungal culture such that ligninases are produced during primary metabolism romping a ligninase-producing white-rot fungal culture; and

b. mixing the ligninase-producing white-rot fungal culture with the soil or water containing said at least one aromatic compound at a concentration and temperature sufficient to degrade enzymatically at least a portion of the aromatic compound in the soil or water.

5,486,475

MEMBRANE MODULE TO REMOVE GASEOUS SUBSTANCES FROM A GAS STREAM

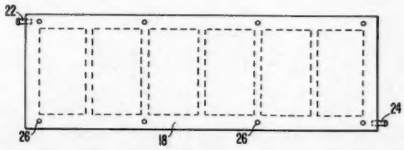
Valentin Kramer, Flurstrasse 3, 83620, Feldkirchen-Westerham, and Gerd Ziegler, Johann-Sebastian-Bach Str. Strasse 2 85591, Vaterstetten, both of, Germany

Filed Feb. 9, 1994, Ser. No. 195,884

Claims priority, application Germany, Feb. 10, 1993, 43 03 936.7

Int. Cl.[6] **C12M** *1/00;* **C12S** *5/00;* **B01D** *63/08*

U.S. Cl. 435—266 **16 Claims**



1. A membrane module for removal of undesirable gaseous substances from a gas stream comprising:

(a) a plurality of membrane pocket assemblies, having planar surfaces, that are stacked on top of one another so as to be parallel to the direction of flow of the gas stream, wherein each assembly further comprises:

(i) a flat circumferential frame having a top surface and a parallel bottom surface and an interior space, wherein the frame determines the outer contours of the assembly, said frame including a supply bore and a drainage bore, both bores connected to the interior space of the frame;

(ii) a gas permeable liquidproof membrane that covers both the top and bottom surfaces of the frame and forms a pocket around the interior space of the frame; and

(iii) a mixture, suitable for reaction with said undesirable gaseous substances, selected from the group consisting of a reaction liquid and a suspension of micro-organisms is located within the pocket, wherein the mixture enters the pocket through the supply bore of the frame and exits through the drainage bore of the frame;

(b) a plurality of spacers wherein a spacer is located at opposite sides of the module and between the adjacent pocket assemblies to form an area between the adjacent assemblies through which the gas stream flows, and further wherein the spacers along one side have supply channel holes for location of a supply channel and the spacers along the other side have drainage channel holes for location of a drainage channel;

(c) said supply channel extends to all of the membrane pocket assemblies and connects with the supply bores in the frames, and further extends through said spacers via the supply channel holes, said supply channel providing the mixture only to the pockets via the supply bores within said frames;

(d) said drainage channel extends to all of the membrane pocket assemblies and connects with the drainage bores in the frames and extends through said spacers via the drainage channel holes, said drainage channel providing an egress for the mixture contained within the membrane pockets;

(e) a top plate that covers the plurality of assemblies, said top plate further including the supply channel that extends to the pocket assemblies and through the spacers; and

(f) a floor plate that goes underneath the plurality of assemblies, said floor plate further including the drainage channel that extends from the pocket assemblies and through the spacers.

5,486,476

LIPOPROTEIN (A) PEPTIDES AND THEIR USE

Geoffrey Burns, Munich; Wolf-Deiter Engel, Feldafing, and Christoph Seidel, Weilheim, all of, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Feb. 9, 1994, Ser. No. 196,940

Claims priority, application Germany, Feb. 9, 1993, 43 04 638.4

Int. Cl.[6] **G01N** *31/00;* **A61K** *38/04;* **C07K** *7/00*

U.S. Cl. 436—15 **9 Claims**

1. A lipoprotein (a) peptide comprising a sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7 and SEQ ID NO: 8, wherein said peptide has a random coil structure which produces a negative band between 190 and 200 nm when examined using CD spectroscopy, and wherein said peptide has the same specificity or antigenicity as a peptide selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7 AND SEQ ID NO: 8.

5,486,477
REAGENT SYSTEM FOR IMPROVED MULTIPLE SPECIES BLOOD ANALYSIS

Edward L. Carver, Jr., 18 Lisa Dr., Oxford, Conn. 06483

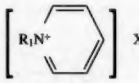
Division of Ser. No. 57,212, May 3, 1993, Pat. No. 5,262,329, which is a continuation of Ser. No. 714,671, Jun. 13, 1991, abandoned. This application Aug. 11, 1993, Ser. No. 105,027

Int. Cl.[6] G01N *1/28*

U.S. Cl. 436—17 **12 Claims**

1. A blood analysis reagent system for the automated or semi-automated differential analysis of white blood cells, comprising:

(1) an aqueous solution of an active lytic reagent consisting essentially of at least one heterocyclic quaternary ammonium compound represented by the formula:



wherein R_1 is a long chain alkyl radical containing from 8 to 20 carbon atoms and X is a halide;

wherein said heterocyclic quaternary ammonium compound(s) of said lytic reagent are present in a quantity sufficient to effect at least a three component differential separation of white blood cells; in combination with

(2) an isotonic blood diluent comprising at least one organic buffer and a cell membrane stabilizing and antimicrobial agent, wherein said cell membrane stabilizing and antimicrobial agent comprises a monoaldehyde, said monoaldehyde being present in the range of 0.01% to 0.15% by volume of said diluent.

5,486,478
METHOD OF MEASURING INGREDIENTS IN LIQUID

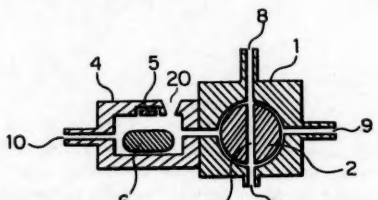
Toshihide Kuriyama, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 73,650, Jun. 7, 1993, abandoned, which is a continuation of Ser. No. 672,389, Mar. 20, 1991, abandoned. This application Dec. 14, 1994, Ser. No. 355,816

Claims priority, application Japan, Mar. 23, 1990, 2-72209

Int. Cl.[6] G01N *35/10*

U.S. Cl. 436—52 **6 Claims**



1. A method of measuring ingredients in a body fluid, said method comprising the steps of:

rotating a valve having a bore therein which forms a reservoir with a fixed volume for receiving a prescribed amount of said body fluid;

placing said bore in communication with an intake port and a suction port of a housing for taking said prescribed amount of said body fluid from said intake port and into the bore in said valve;

rotating said valve a second time to place said bore in communication with an introduction port for introducing a diluent into said bore and into a cell having a stirrer and a sensor therein, said cell having a discharge port, said second rotation of said valve occurring when said bore is filled with said prescribed amount of said body fluid;

transferring a sample of said prescribed amount of said body fluid from said bore and into said cell by a pressing force occurring with the introduction of said diluent into said bore;

diluting said prescribed amount of said body fluid with said diluent along with a stirring by said stirrer;

measuring a concentration of ingredients in said diluted body fluid by said sensor for detecting the ingredients, while said diluted body fluid is being stirred in said cell;

pouring a diluent into said cell through a port thereof and discharging said measured and diluted body fluid out of said cell; and

repeating the above steps in the named order.

5,486,479
BUFFER FOR IMMUNOASSAY, KIT INCLUDING SAME AND IMMUNOASSAY METHOD USING SAID BUFFER

Michio Ito; Satoshi Sugawa, both of Tokyo, Japan, and Atsushi Yanagida, Carmel, Ind., assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

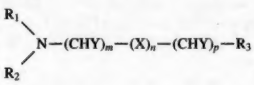
Filed May 2, 1994, Ser. No. 235,876

The portion of the term of this patent subsequent to May 2, 2014, has been disclaimed.

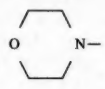
Int. Cl.[6] G01N *33/546*

U.S. Cl. 436—533 **19 Claims**

1. A kit comprising two components A and B, component A comprising an immunoreactant immobilized on a solid support, component B comprising a buffer composition comprising a buffering agent, sodium chloride, choline chloride, a polysaccharide, fatty-acid-free serum albumin and a non-specific reaction suppressor of the formula:



wherein X is —NH—(CO)—NH—, —NH—(CS)—NH—, or —N=C=N—, R_1 and R_2, which may be the same or different, are C_1–C_5 linear or branched alkyl groups, or R_1 and R^2, together with nitrogen, is



or the metho-p-toluenesulfonate salt thereof,

Y, which may be the same or different, is any of H, OH and halogen,

R_3 is $—NR_1R_2$, $—NH_2$, —CHY, cyclohexyl, or H,

m is an integer of from 2 to 5,

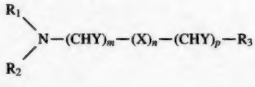
p is an integer of from 0 to 5, and

n is 0 or 1,

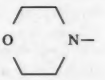
and the acid addition salts thereof.

13. An immunoassay method comprising the steps of:

mixing a sample comprising an analyte to be detected with a buffer composition comprising water, a buffering agent, sodium chloride, choline chloride, a polysaccharide, fatty-acid-free serum albumin, and a non-specific reaction suppressor of the formula



wherein X is —NH—(CO)—NH—, —NH—(CS)—NH—, or —N=C=N—, R_1 and R_2, which may be the same or different, are C_1–C_5 linear or branched alkyl groups, or R_1 and R_2, together with nitrogen, is



or the metho-p-toluenesulfonate salt thereof,

Y, which may be the same or different, is any of H, OH and halogen,

R_3 is $—NR_1R_2$, $—NH_2$, —CHY, cyclohexyl, or H,

m is an integer of from 2 to 5,

p is an integer of from 0 to 5, and

n is 0 or 1,

and the acid addition salts thereof, to produce a buffer-sample mixture,

contacting said buffer sample mixture with a solid support having immobilized thereon an immunoreactant which specifically reacts with said analyte to be detected so as to form a specific binding complex, and determining formation of said specific binding complex to detect said analyte.

5,486,480

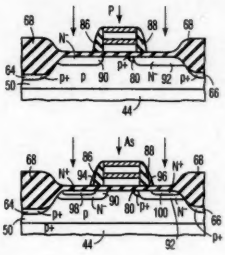
METHOD OF FABRICATION OF PROTECTED PROGRAMMABLE TRANSISTOR WITH REDUCED PARASITIC CAPACITANCES

Teh-Yi J. Chen, Cupertino, Calif., assignor to North American Philips Corporation, New York, N.Y.

Division of Ser. No. 700,663, May 15, 1991, Pat. No. 5,424,467. This application Oct. 28, 1994, Ser. No. 330,645

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—29 **3 Claims**



1. A method of fabricating a programmable transistor from a monocrystalline semiconductor body that comprises a surface-adjoining main zone of a first conductivity type, the method comprising the steps of:

creating a charge storage region over a channel region in the main zone;

introducing into the main zone a first dopant of the first conductivity type for providing a first impurity zone of the first conductivity type that extends into the channel region and is more heavily doped than the main zone;

introducing into the main zone a second dopant of a second conductivity type opposite to the first for furnishing a lightly doped second impurity region laterally contiguous with the first impurity zone;

introducing into the second region a third dopant of the second conductivity type for creating a surface-adjoining third impurity region that is embedded in and more heavily doped than the second impurity region, wherein a spacer is formed over the first region and alongside the charge storage region prior to introducing the second dopant.

5,486,481

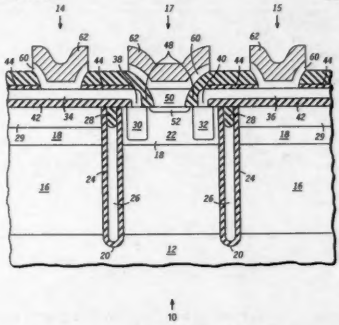
METHOD FOR FORMING A LATERAL BIPOLAR TRANSISTOR

Lalgudi M. G. Sundaram, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 801,282, Dec. 2, 1991, Pat. No. 5,397,912. This application Nov. 21, 1994, Ser. No. 342,476

Int. Cl.[6] H01L *21/8222*

U.S. Cl. 437—31 **18 Claims**



1. A method for making a lateral bipolar transistor comprising the steps of:

forming an isolated semiconductor tub of a first conductivity type;

etching a first trench and a second trench in the isolated semiconductor tub;

filling the first and second trenches with doped polycrystalline semiconductor material of a second conductivity type to form a first and a second filled trench, wherein the first filled trench forms an emitter region and the second filled trench forms a collector region, and wherein that portion of the semiconductor tub between emitter region and the collector region forms a base region;

forming a doped polycrystalline semiconductor layer of the first conductivity type on the isolated semiconductor tub between the emitter and collector regions;

forming a first spacer on the emitter region:

forming a second spacer on the collector region;

forming a first extension doped in the second conductivity type such that the first extension is coupled to the first spacer, wherein the first extension extends laterally beyond the isolated semiconductor tub;

forming a second extension doped in the second conductivity type such that the second extension is coupled to the second spacer, wherein the second extension extends laterally beyond the isolated semiconductor tub:

forming a base electrode on the doped polycrystalline semiconductor layer:

forming an emitter electrode on the first extension: and

forming a collector electrode on the second extension.

5,486,482

PROCESS FOR FABRICATING METAL-GATE CMOS TRANSISTOR

Sheng-Hsing Yang, Hsinchu, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

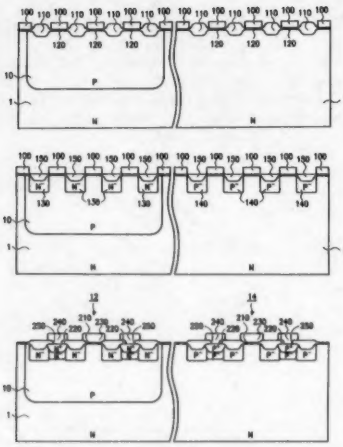
Filed May 9, 1995, Ser. No. 437,724

Int. Cl.[6] H01L *21/8238;21/8234*

U.S. Cl. 437—34 **10 Claims**

1. A process for fabricating a metal-gate MOS transistor for use in CMOS integrated circuits formed on a semiconducting substrate of a first conductivity type having a well region of a second conductivity type therein, comprising:

(a) forming a shielding layer with designated patterns on said well region;



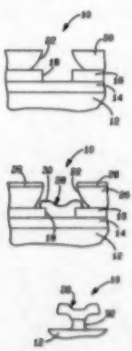
(b) forming first field oxides on said well region between said designated patterns through a thermal oxidation procedure;
(c) removing said first field oxides exposing recesses;
(d) forming drift regions of said first conductivity type in said well region beneath said recesses;
(e) forming second field oxides above said drift regions;
(f) removing said shielding layer;
(g) forming heavily-doped regions of said first conductivity type in said well region between each pair of said drift regions and lightly-doped regions of said first conductivity type beneath said heavily-doped region as source/drain regions;
(h) forming a gate oxide layer on said well region between said source/drain regions and an isolation oxide layer on said heavily-doped regions; and
(i) forming a metal gate on said gate oxide layer.

5,486,483

METHOD OF FORMING CLOSELY SPACED METAL ELECTRODES IN A SEMICONDUCTOR DEVICE

Michael D. Lammert, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sep. 27, 1994, Ser. No. 312,845
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—39 **20 Claims**



1. A method of forming electrodes associated with different regions of a semiconductor device, said method comprising the steps of:

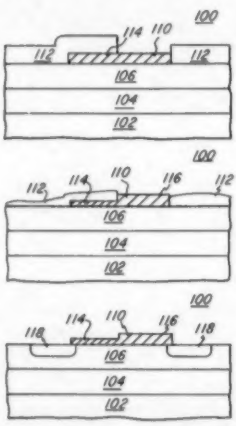
providing a first semiconductor layer and a second semiconductor layer, said first semiconductor layer being on top of said second semiconductor layer;
providing a first sacrificial layer in contact with the first semiconductor layer and opposite to the second semiconductor layer;
providing a first photoresist layer over the first sacrificial layer opposite to the first semiconductor layer;
forming a first re-entrant profile opening in the first photoresist layer;
forming an opening in the first sacrificial layer through the first re-entrant profile opening of the first photoresist layer to expose the first semiconductor layer;
enlarging the first re-entrant profile opening in the first photoresist layer;
providing a first electrode in contact with the first semiconductor layer; and
etching the first sacrificial layer and the first semiconductor layer so as to remove the first sacrificial layer and a portion of the first semiconductor layer so as to form a first semiconductor region beneath and in contact with the first electrode, wherein the step of enlarging the first re-entrant profile opening selectively controls the lateral spacing between the first semiconductor region and a second electrode contacting the second semiconductor layer.

5,486,484

LATERAL POWER MOSFET STRUCTURE USING SILICON CARBIDE

Satwinder Malhi, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 20,475, Feb. 22, 1993. This application Jul. 25, 1994, Ser. No. 255,023
Int. Cl.[6] H01L *21/443*
U.S. Cl. 437—41 **4 Claims**

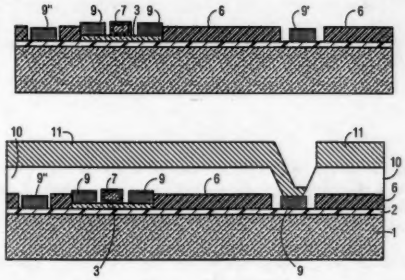


1. A method of forming a MOSFET having a silicon carbide substrate of a first conductivity type, comprising the steps of:
epitaxially growing a layer of second conductivity type material on said silicon carbide substrate;
epitaxially growing a channel region of said first conductivity type above said layer of second conductivity type material;
thermally growing a first insulator layer over a portion of said channel region;
thermally growing a second insulator layer over a portion of said first insulator layer; implanting first and second source/drain regions with a dopant of said first conductivity type directly in said channel region; and
forming a conductive layer over said first and second insulator layers.

5,486,485
METHOD OF MANUFACTURING A REFLECTIVE DISPLAY

Manjin J. Kim, Ossining, and Satyendranath Mukherjee, Yorktown Heights, both of N.Y., assignors to Philip Electronics North America Corporation, New York, N.Y.

Filed Feb. 18, 1994, Ser. No. 198,243
Int. Cl.[6] H01L *21/84*
U.S. Cl. 437—41 **7 Claims**



1. A method of making a plurality of information pixels for a reflective display comprising the steps of:

(a) forming a layer of SiO2 on a silicon substrate,

(b) forming a plurality of SOI thin film transistors on said layer of SiO2,

(c) forming a storage capacitor adjacent to each of said plurality of SOI thin film transistors,

(d) forming a plurality of metal lines in contact with each of said SOI thin film transistors and each of said storage capacitors,

(e) covering each of said SOI thin film transistors and each of said storage capacitors with a thickness of a planarized layer of polyimide,

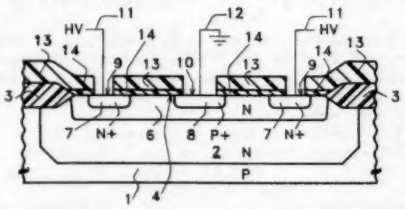
(f) separating said planarized layer of polyimide covering each SOI thin film transistor and each storage capacitor into individual areas having a covering of said polyimide layer, and

(g) covering each individual planarized layer of polyimide with a thickness of a reflective metal electrode to form a plurality of individual pixels.

5,486,486
PROCESS FOR THE MANUFACTURE OF AN INTEGRATED VOLTAGE LIMITER AND STABILIZER IN FLASH EEPROM MEMORY DEVICES

Paolo Ghezzi, Rivolta D'Adda, and Alfonso Maurelli, Sulbiate, both of, Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Milan, Italy

Filed Sep. 7, 1994, Ser. No. 301,792
Claims priority, application European Pat. Off., Sep. 10, 1993, 93830365
Int. Cl.[6] H01L *21/8247*
U.S. Cl. 437—43 **8 Claims**



1. A process for the manufacture of an integrated voltage limiter and stabilizer component in a flash EEPROM memory device including flash EEPROM memory cells and N channel and P channel MOS transistors, the process comprising the following steps:

(a) forming N type lightly doped wells for the voltage limiter and stabilizer and for the P channel MOS transistors on a single crystal silicon substrate;

(b) forming active areas on the surface of said N type wells for the voltage limiter and stabilizer and for the. P channel MOS transistors, and on the surface of the silicon substrate for the N channel MOS transistors and for the flash EEPROM memory cells;

(c) growing a gate oxide layer over said active areas;

(d) implanting a first dose of N type dopant into said N type well for the voltage limiter and stabilizer to obtain an N type region, and into the silicon substrate to form source regions for the flash EEPROM memory cells;

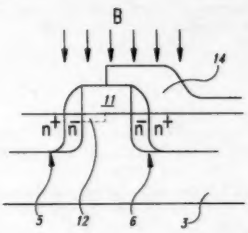
(e) implanting a second dose, higher than said first dose, of N type dopant into said N type region to obtain an N+ contact region to both the N type well for the voltage limiter and stabilizer and said N type region, and into said silicon substrate to form source and drain regions of the N channel MOS transistors;

(f) implanting a third dose, higher than said first dose, of P type dopant into said N type region to form a P+ region, and into the N type wells for the P channel MOS transistors to form source and drain regions for the P channel MOS transistors.

5,486,487
METHOD FOR ADJUSTING THE THRESHOLD OF A READ-ONLY MEMORY TO ACHIEVE LOW CAPACITANCE AND HIGH BREAKDOWN VOLTAGE

Giancarlo Ginami, Bergamo; Enrico Laurin, Monza; Silvia Lucherini, Milan, and Bruno Vajana, Bergamo, all of, Italy, assignors to SGS-Thomson Microelectronics S.r.l., Milan, Italy

Continuation-in-part of Ser. No. 678,557, Mar. 29, 1991, abandoned. This application Oct. 19, 1993, Ser. No. 139,800
Claims priority, application Italy, Mar. 30, 1990, 19903/90
Int. Cl.[6] H01L *21/266*
U.S. Cl. 437—45 **10 Claims**



1. A method of manufacturing a programmed memory cell of a read-only memory array comprising the steps of:

defining an active area for a field effect memory element on a semiconductor substrate having a first conductivity type, the active area having a channel region, and a source region and a drain region on opposite sides of the channel region;

forming a gate insulating layer overlying at least a portion of the active area;

forming a gate electrode of uniform thickness overlying the gate insulating layer and positioned over the channel region;

forming a programming mask having a programming mask aperture positioned over at least a portion of the source region;

implanting a doping impurity of the first conductivity type into the semiconductor substrate through the programming mask aperture to program the memory cell;

implanting a doping impurity of a second conductivity type into the gate electrode and into the source and drain regions, causing the gate electrode and the source and drain regions to be doped with the second conductivity type impurity; and

heating the semiconductor substrate to diffuse the doping impurity of the first conductivity type into the channel region and

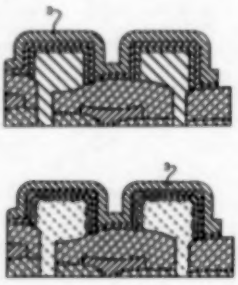
of the second conductivity type into the gate electrode of the source region and the drain regions.

5,486,488

PROCESS FOR MANUFACTURING SEMICONDUCTOR DEVICE

Satoshi Kamiyama, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 1, 1994, Ser. No. 347,712
Claims priority, application Japan, Dec. 2, 1993, 5-302473
Int. Cl.[6] H01L *21/8242*
U.S. Cl. 437—60 **7 Claims**



1. A process for manufacturing a capacity element on a semiconductor device comprises:

a step of forming a capacity lower electrode having, on a surface of the semiconductor device, a first conductive film,

a step of forming a capacity insulating film comprising a tantalum oxide film,

a step of subjecting the tantalum oxide film to a densification treatment at a temperature in a range of from room temperature to 300° C., and

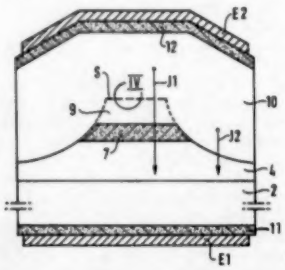
a step of forming a capacity upper electrode comprising a second conductive film.

5,486,489

METHOD OF MANUFACTURING A SEMICONDUCTOR COMPONENT, IN PARTICULAR A BURIED RIDGE LASER

Léon Goldstein, Chaville, and Dominique Bonnevie, Leuville sur Orge, both of, France, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Feb. 3, 1994, Ser. No. 191,165
Claims priority, application France, Feb. 4, 1993, 93 01212
Int. Cl.[6] H01L *21/20*
U.S. Cl. 437—129 **7 Claims**



1. A method of manufacturing a semiconductor component, the method involving:

forming a semiconductor base (**9**) which has a cleansed surface (S) and which is doped with a dopant having a conductivity type; and

depositing a doped semiconductor coating (**10**) on said cleansed surface (S), which doped semiconductor coating is doped with a dopant having the same conductivity type as the dopant of the base;

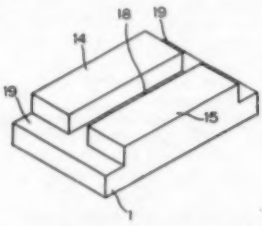
said method being characterized by the fact that depositing said coating (**10**) involves depositing a superdoped layer (**24**) atop said cleansed surface (S), which superdoped layer is deposited with a dopant having said same conductivity type and having a concentration that is greater than twice a mean dopant concentration of the coating (**10**).

5,486,490

METHOD OF MAKING SEMICONDUCTOR LASER

Syoichi Kakimoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 160,748, Dec. 3, 1993, abandoned. This application Sep. 2, 1994, Ser. No. 298,968
Claims priority, application Japan, Dec. 15, 1992, 4-354578
Int. Cl.[6] H01L *21/20*
U.S. Cl. 437—129 **6 Claims**



1. A method of making a semiconductor laser comprising:

forming a semiconductor substrate of a first conductivity type to include two opposed mesas separated by a central groove and adjacent two regions transverse to, contiguous to, and continuous with the central groove;

successively, epitaxially growing a first cladding layer of a first conductivity type, an active layer comprising a multiple quantum well structure including alternating well and barrier layers, a second cladding layer of a second conductivity type, opposite the first conductivity type, and a contact layer of the second conductivity type on the semiconductor substrate using a process producing thicker well layers in the groove than in the two regions; and

forming first and second electrodes on the substrate and the contact layer, respectively.

5,486,491

CERAMIC FERROELECTRIC COMPOSITE MATERIAL - BSTO-ZRO_2

Louise Sengupta, Woburn; Eric Ngo, Brighton; Steven Stowell, Jamaica Plain; Michelina O'Day, Andover, and Robert Lancto, Wakefield, all of Mass., assignors to The United States of America as represented by The Secretary of the Army, Washington, D.C.

which is a continuation-in-part of Ser. No. 76,291, Jun. 9, 1993, abandoned. This application Mar. 7, 1994, Ser. No. 207,447
Int. Cl.[6] C04B *35/49*
U.S. Cl. 501—137 **4 Claims**

1. A sintered ceramic ferrolectric composite material for use in array antennas and the like, consisting essentially of:

Barium Strontium Titanate, said Barium Strontium Titanate represented as $BA_{1-x}Sr_xTiO_3$, wherein X is greater than 0.0, but less than or equal to 0.70, and

Zirconia;

wherein said Barium Strontium Titanate and Zirconia are present in an amount sufficient to provide a composite having a dielectric constant of about 60 to 3800, low loss tangent of the range of 0.03 or less, and a high tunability. of about 1.67 to 46%.

5,486,492

METHOD OF FORMING MULTILAYERED WIRING STRUCTURE IN SEMICONDUCTOR DEVICE

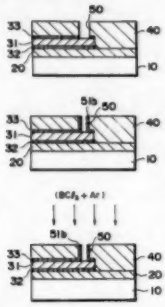
Hiroshi Yamamoto; Nobuyuki Takeyasu, both of Chiba, and Tomohiro Ohta, Urayasu, all of, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Oct. 29, 1993, Ser. No. 142,971

Claims priority, application Japan, Jan. 30, 1992, 4-293124

Int. Cl.[6] H01L *21/285;21/3065*

U.S. Cl. 437—192 **40 Claims**



1. A method of manufacturing a semiconductor device having a multilayered structure including a lower wiring layer that contacts an upper surface of a substrate and an insulating interlayer formed on the lower wiring layer, the method comprising:

forming a via hole in said insulating interlayer;

applying a thin film on at least part of a sidewall of the via hole formed in the insulating interlayer and on an entire upper surface of the insulating interlayer in which the via hole is formed, the thin film including a high melting point metal or a high melting point metal compound selected from the group consisting of a nitride, an oxynitride, a boride, and a boronitride;

entirely removing the thin film from the upper surface of the insulating interlayer; and

performing selective chemical vapor deposition to fill the remaining portion of the via hole with a conductive material including one of Al and an Al alloy, thereby forming a via plug.

5,486,493

PLANARIZED MULTI-LEVEL INTERCONNECT SCHEME WITH EMBEDDED LOW-DIELECTRIC CONSTANT INSULATORS

Shin-Puu Jeng, 2508 Evergreen Dr., Plano, Tex. 75075

Continuation of Ser. No. 202,057, Feb. 25, 1994, abandoned. This application Apr. 26, 1995, Ser. No. 430,095

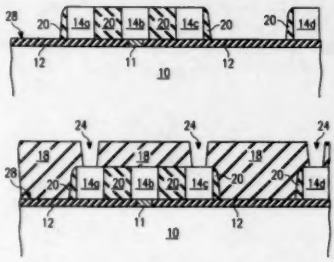
Int. Cl.[6] H01L *21/44;21/48*

U.S. Cl. 437—195 **12 Claims**

1. A method for forming an interconnect structure on a semiconductor body, comprising the steps of:

a. forming a plurality of spaced interconnect lines on said semiconductor body;

b. filling the space between all adjacent interconnect lines having a distance therebetween no greater than a given distance with an insulating material having a dielectric constant lower than the dielectric constant of silicon dioxide and greater than



or equal to one, and leaving an unfilled open field area between adjacent interconnect lines having a distance therebetween greater than said given distance;

c. depositing a first layer of silicon dioxide over said interconnect lines, said open field area and said insulating material.

5,486,494

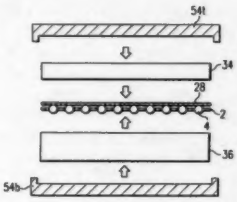
METHOD AND APPARATUS FOR AFFIXING SPHERES TO A CONDUCTIVE SHEET

Gregory Hotchkiss, Richardson, and Jules D. Levine, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 22, 1994, Ser. No. 279,572

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 **29 Claims**



1. A method of affixing a conductive foil sheet to each of a plurality of semiconductor members mounted in a conductive foil matrix, said method comprising the steps of:

providing a cell matrix including said conductive foil matrix with said members mounted therein and an insulating layer disposed on each of said members;

removing a portion of said insulating layer from each of said members to expose a portion of said members;

forming a cell sandwich between an upper pressure pad and a lower pressure pad, said cell sandwich including said cell matrix and said conductive foil sheet;

disposing said cell sandwich within a clamshell;

heating said cell sandwich; and

affixing said members to said conductive foil sheet by directing said cell sandwich within said clamshell through a roll press thereby compressing said cell sandwich.

5,486,495

GERMANATE GLASS CERAMIC

John M. Jewell, Taunton, Mass.; Barry B. Harbison, Dunkirk, Md.; Ishwar D. Aggarwal, Springfield, and Shyam S. Bayya, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1994, Ser. No. 363,074

Int. Cl.[6] C03C *10/02;3/253*

U.S. Cl. 501—10 **13 Claims**

1. A glass ceramic article comprising 25–80 mol percent germanium oxide, 10–60 mol percent barium oxide and 5–30 mol per-

cent gallium oxide, based on the total mols of germanium oxide, barium oxide and gallium oxide, wherein the total of the germanium oxide and barium oxide is more than 50 mol percent, which article is over 98% by volume crystalline.

5,486,496

GRAPHITE-LOADED SILICON CARBIDE

Lloyd G. Talbert, Alexander, and Stephen M. Brazil, Benton, both of Ark., assignors to Alumina Ceramics Co. (ACI), Benton, Ark.

Filed Jun. 10, 1994, Ser. No. 259,916

Int. Cl.[6] C04B *35/577*

U.S. Cl. 501—90 **13 Claims**

12. A sintered ceramic body, comprising:

(a) at least about 85 weight percent silicon carbide;

(b) at least about 5 weight percent graphite inclusions having an average size of at least about 100 micrometers; and

(c) less than about 0.5 weight percent unreacted silicon metal;

wherein said sintered ceramic body has a density of at least about 2.8 g/cc and a tensile strength of at least about 100 MPa.

5,486,497

CERAMIC FIBER YARN, AND A METHOD OF AND A SPINNING MACHINE FOR MAKING THE SAME

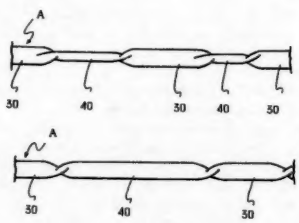
Kyuji Katsuoka; Noriho Harumiya; Tadahiro Hashizume, and Tadashi Kitahara, all of Nagano, Japan, assignors to Taimei Kagaku Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Feb. 4, 1994, Ser. No. 191,933

Claims priority, application Japan, Feb. 8, 1993, 5-019958

Int. Cl.[6] D02G *3/06;* **C04B** *35/10*

U.S. Cl. 501—95 **5 Claims**



1. A ceramic fiber yarn comprising a group of filaments, said filaments being made by the steps of spinning a mother liquid, which comprises colloidal silica and basic aluminum chloride, and firing, said filaments comprising 67–75 wt % of alumina and 25–33 wt % of silica and mainly having polycrystalline transition alumina,

wherein the loop strength of each said filament, which is measured by a wire having diameter of 0.5 mm, is at least 2.5×10^{-2} N;

the crystal structure of said filament substantially changes to polycrystalline mullite after heating for 30 minutes at a temperature of 1,400° C.; and

wherein a part of said filaments of said group have flat shapes in the transverse sections and twisted sections, which are serially formed, with separations, in the axial direction of said filaments.

5,486,498

ZEOLITE L

Johannes P. Verduijn, Spijkenisse, Netherlands, assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Division of Ser. No. 87,225, Jul. 2, 1993, Pat. No. 5,396,009, which is a division of Ser. No. 825,408, Jan. 24, 1992, Pat. No. 5,242,675, which is a continuation of Ser. No. 715,011, Jun. 13, 1991, abandoned, which is a continuation of Ser. No. 501,406, Mar. 29, 1990, abandoned, which is a continuation of Ser. No. 481,484, Feb. 16, 1990, abandoned, which is a continuation of Ser. No. 298,336, Jan. 17, 1989, abandoned, which is a continuation of Ser. No. 918,457, Oct. 14, 1986, abandoned. This application Mar. 3, 1995, Ser. No. 398,250

Int. Cl.[6] B01J *29/06*

U.S. Cl. 502—66 **8 Claims**

1. A catalyst containing a catalytically active metal and zeolite L comprising cylindrical crystallites having basal planes shaped such that the ratio of axial length of curved cylindrical surface (m) to the overall axial length of the crystallite (h) is greater than 0.9; wherein said zeolite is crystallized from a synthesis mixture containing a source of alkali metal selected from the group consisting of potassium and a mixture of potassium and sodium and further comprising a source of additional metal selected from the group consisting of magnesium, calcium, barium, manganese, chromium, cobalt, nickel and zinc cations, said additional metal being present in an amount in the range of from about 0.1 ppm to about 0.1 wt % based on said synthesis mixture.

5,486,499

PILLARED CLAYS

Mary E. Davies; Mavis E. Whittle, both of Cheshire; William Jones, and Robert Mokaya, both of Cambridge, all of, England, assignors to Laporte Industries Limited, England

PCT No. PCT/GB92/00674, § 371 Date Feb. 3, 1993, § 102(e) Date Feb. 3, 1993, PCT Pub. No. WO92/19533, PCT Pub. Date Nov. 12, 1992

PCT Filed Apr. 13, 1992, Ser. No. 140,007

Claims priority, application United Kingdom, Apr. 24, 1991, 9108771

Int. Cl.[6] B01J *21/16*

U.S. Cl. 502—81 **22 Claims**

1. A process for the production of a material suitable for use in the purification of edible oils or as a catalyst support the process comprising treating a layered clay mineral comprising structural aluminum and silicon with a solution of a pillaring material so as to cause adsorption of at least some of the pillaring material into the clay mineral and removing solvent to deposit pillaring material within the clay mineral the process being characterized by acid treating the clay mineral, prior to contact with the pillaring material, at a temperature of at least 70° C. with acid at a concentration of at least 10% by weight so as to increase the silica to alumina ratio in the clay mineral by at least 10% by the removal of structural aluminum.

5,486,500

PRINTED TOWEL AND PROCESS

Mark S. Kaufman, 200 Ingleside Dr., Stamford, Conn. 06903

Continuation-in-part of Ser. No. 845,717, Mar. 4, 1992, abandoned. This application Oct. 20, 1993, Ser. No. 94,603

Int. Cl.[6] B41M *5/035;5/38;* **D06P** *3/54*

U.S. Cl. 503—227 **19 Claims**

1. A printed towel having two faces, a first face comprising a print receiving face which comprises at least about 65% of a relatively non-absorbent material able to receive printing by sublimation printing techniques, wherein said relatively non-absorbent material comprises a material selected from the group consisting of polyester, nylon, acrylic or combinations thereof, said print receiving face having four color process printing applied thereon by

sublimation of sublimation inks; and a second face comprising an absorbent material having a net moisture regain of at least about 3.5%.

5,486,501

NONEQUILIBRIUM PRECURSORS FOR SUPERCONDUCTOR MATERIALS AND PROCESS FOR MAKING SHAPED SUPERCONDUCTOR ARTICLES THEREFROM

Shome N. Sinha, 220 N. Lombard Ave., Oak Park, Ill. 60302

Division of Ser. No. 821,692, Jan. 16, 1992, Pat. No. 5,300,483. This application Feb. 9, 1994, Ser. No. 194,044

Int. Cl.[6] C01F *11/02;17/00;* **C01G** *3/02;* **H01L** *39/24*

U.S. Cl. 505—510 **13 Claims**

1. A superconductor precursor comprising a blend of $BaCuO_{2.5}$, and an oxide of copper and an oxide of at least one other metal, said precursor being in the form of particles having a maximum particle size of about 5 microns for at least 99 weight percent of said blend, the oxides being in a proportion sufficient to provide a total level of oxygen above that which, after fusion of said blend, produces a superconductor of a formula having more than one atom of trivalent copper.

5,486,502

2-METHOXY-4-FORMYL PHENYL ESTER OF PROPIONIC ACID AND USE IN AUGMENTING OR ENHANCING THE AROMA OF PERFUME COMPOSITIONS, COLOGNES AND PERFUMED ARTICLES

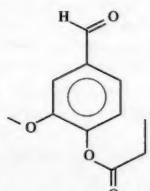
Mark A. Sprecker, Sea Bright; Richard A. Weiss, Pine Brook, and Marie R. Hanna, Keyport, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Dec. 15, 1994, Ser. No. 356,523

Int. Cl.[6] A61K *7/46*

U.S. Cl. 512—21 **12 Claims**

1. 2-Methoxy-4-formyl phenyl ester propionic acid having the structure:



5,486,503

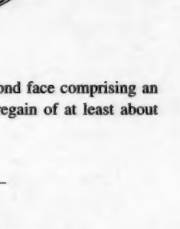
ANTI-FUNGAL HISTATIN-BASED PEPTIDES

Frank G. Oppenheim, Chestnut Hill, and Tao Xu, Somerville, both of Mass., assignors to The Trustees of Boston University, Boston, Mass.

Continuation of Ser. No. 145,030, Oct. 28, 1993, abandoned, which is a continuation of Ser. No. 786,571, Nov. 1, 1991, abandoned. This application Aug. 9, 1994, Ser. No. 287,717

Int. Cl.[6] A61K *38/10;38/16;* **C07K** *7/04;14/00*

U.S. Cl. 514—2 **4 Claims**



1. A composition for treating fungal infection comprising a substantially pure peptide having an amino acid sequence selected from the group consisting of:

a) the amino acid sequence of SPM-H3 as set for in SEQ ID NO: 2;

b) the amino acid sequence of 3P1 as set forth in SEQ ID NO: 3;

c) the amino acid sequence of 3P2 as set forth in SEQ ID NO: 4;

d) the amino acid sequence of 3P3 as set forth in SEQ ID NO: 5;

e) the amino acid sequence of 3P4 as set forth in SEQ ID NO: 6;

f) the amino acid sequence of 3P5 as set forth in SEQ ID NO: 7;

g) the amino acid sequence of M-histatin 1 as set forth in SEQ ID NO: 8;

h) the amino acid sequence of SPM-MHa as set forth in SEQ ID NO: 10;

i) the amino acid sequence of SPM-MHb as set forth in SEQ ID NO: 11;

j) the amino acid sequence of SPM-MHc as set forth in SEQ ID NO: 12; and

k) combinations of two or more of the above.

5,486,504

Patent Not Issued For This Number

5,486,505

POLYPEPTIDE COMPOUNDS HAVING GROWTH HORMONE RELEASING ACTIVITY

Cyril Y. Bowers, New Orleans, La.; Wayne L. Cody, Saline, Mich.; John C. Hubbs; Charles H. Foster, both of Kingsport, Tenn., and Frank A. Momany, Wellesley, Mass., assignors to Polygen Holding Corporation, Wilmington, Del.

Continuation of Ser. No. 557,226, Jul. 24, 1990, abandoned. This application Oct. 16, 1992, Ser. No. 962,069

Int. Cl.[6] A61K *38/00;* **C07K** *7/06*

U.S. Cl. 514—16 **24 Claims**

1. A peptide having the formula

$$A_1—D^{\beta}Nal—A_3—Trp—A_5—A_6—Z,$$

wherein A_1 is His, 3(NMe)His, His—Ala, Ala, Tyr, A_0—His or A_0—3(NMe)His, where A_0 is Ala, Lys, or Glu Met(O), DOPA, Abu or peptides of the formula L—A_0, wherein L is H, DOPA, Lys, Phe, Tyr, Cys, Tyr—DAla—Phe—Gly, Tyr—DAla—Gly—Phe, Tyr—Ala—Gly—Thr or Tyr—DAla—Phe—Sar;

A_3 is Ala, Gly or Ser;

A_5 is DPhe, D/L$^{\beta}$(Me)Phe or (NMe)DPhe;

A_6 is Arg, iLys, Lys or Orn;

Z is NH_2;

and organic or inorganic pharmaceutically acceptable salts thereof.

5,486,506

METHOD FOR TREATING CARDIAC INOTROPIC IRREGULARITIES

Michael Dunn, New Rochelle, N.Y., assignor to Meditech, Ltd., Chappaqua, N.Y.

Continuation of Ser. No. 934,178, Aug. 21, 1992, abandoned. This application Jul. 28, 1994, Ser. No. 281,767

Int. Cl.[6] A61K *31/19;31/705;* **A01N** *37/00*

U.S. Cl. 514—26 **12 Claims**

1. A method for treating a subject with a cardiac disorder associated with an inotropic irregularity, wherein said inotropic irregularity is selected from the group consisting of atrial fibrillation, heart flutter and supraventricular tachycardia comprising administering to said subject an amount of 12(R) hydroxyeicosatetraenoic acid (12(R)HETE)sufficient to regulate said inotropic irregularity without inducing arrythmia in said subject.

5,486,507

POROUS PARTICLE AGGREGATE AND METHOD THEREFOR

Roy L. Whistler, West Lafayette, Ind., assignor to Fuisz Technologies Ltd., Chantilly, Va.

Filed Jan. 14, 1994, Ser. No. 182,442

Int. Cl.[6] A61K *31/715;* **C07H** *1/00;* **C08B** *30/00;31/00*

U.S. Cl. 514—54 **13 Claims**

1. A composition comprising substantially spherical porous aggregates of starch granules bound together with a binder at least at their points of contact in said aggregates, the surfaces of the aggregated starch granules cooperating to define an intraaggregate reticulate volume for releasable containment of a functional substance, said aggregates having an average diameter of about 5 to about 250 microns.

5,486,508

CYCLODEXTRIN COMPOSITION

Yoshiaki Uda, Takarazuka; Yoko Nishida, Ibaraki, and Yasuaki Ogawa, Ohyamazaki, all of, Japan, assignors to TAKEDA Chemical Industries Ltd., Osaka, Japan

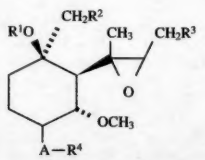
Continuation of Ser. No. 901,501, Jun. 19, 1992, abandoned. This application Apr. 28, 1994, Ser. No. 236,699

Claims priority, application Japan, Jun. 21, 1991, 3-150507; Sep. 10, 1991, 3-230489

Int. Cl.[6] A61K *31/715;31/335;47/00*

U.S. Cl. 514—58 **11 Claims**

1. A powder composition which comprises a complex of a fumigillol derivative and a cyclodextrin prepared by: preparing a drug solution by dissolving in a water soluble organic solvent a slightly water soluble drug which is a fumagillol derivative represented by the formula:



(I)

wherein R^1 is hydrogen; R^2 is halogen, $N(O)mR^5R^6$, $N^+R^5R^6R^7 \cdot X^-$, $S(O)nR^5$ or $S^+R^5R^6 \cdot X^-$, wherein R^5, R^6 and R^7 are independently an optionally substituted hydrocarbon or heterocyclic group; X^- is a counter anion; m is 0 or 1; n is an integer of 0 to 2; or R^5 and R^6 together with the adjacent nitrogen or sulfur atom may form an optionally substituted nitrogen- or sulfur-containing heterocyclic group which may form a condensed ring; or R^1 and R^2 together represent a bond; R^3 is 2-methyl-1-propenyl group or isobutyl group; A is O or NR^8, wherein R^8 is hydrogen or an optionally substituted lower alkyl or aryl group; and R^4 is hydrogen, an optionally substituted hydrocarbon group or an optionally substituted acyl group; or a physiologically acceptable salt thereof,

preparing a cyclodextrin solution by dissolving a cyclodextrin in water or an aqueous buffer;

mixing the cyclodextrin solution into the drug solution so that the resulting solution contains a molar ratio of the cyclodextrin to the drug of about 1.2:1 to 3:1 and the water soluble organic solventis present in an amount from about 0.1 to 10% by weight based on the total solids; and

lyophilizing or drying under reduced pressure the resulting mixed solution to form a powder;

wherein the powder has substantially increased solubility in aqueous solution compared to the drug.

5,486,509

METHOD OF PREVENTING AND TREATING CHEMOTHERAPY-INDUCED ALOPECIA

Joaquin J. Jimenez, and Adel A. Yunis, both of Miami, Fla., assignors to University of Miami, Miami, Fla.

Continuation of Ser. No. 903,829, Jun. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 810,412, Dec. 20, 1991, abandoned, which is a continuation-in-part of Ser. No. 786,788, Nov. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 722,500, Jun. 28, 1991, abandoned. This application May 27, 1994, Ser. No. 250,646

Int. Cl.[6] A61K *31/59;* **C07C** *401/00*

U.S. Cl. 514—167 **37 Claims**

1. A method of reducing chemotherapy-induced alopecia comprising administering to a host treated with at least one chemotherapeutic agent which induces such alopecia an effective amount of vitamin D_3 or derivative or analog or active metabolite thereof.

5,486,510

METHOD AND COMPOSITIONS FOR MODULATING OR CONTROL OF IMMUNE RESPONSES IN HUMANS

Patrick J. D. Bouic, Ronderbosch East, and Carl F. De Vosa Albrecht, Durbanville, both of, South Africa, assignors to Rooperol (NA) NV, Amsterdam, Netherlands

Division of Ser. No. 857,394, Mar. 25, 1992, abandoned. This application Nov. 8, 1993, Ser. No. 148,504

Claims priority, application South Africa, Mar. 28, 1991, 91/2349

Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—170 **12 Claims**

1. A method for the treatment of diseases caused by perturbations of normal lymphocyte homeostasis, comprising administering

to a human suffering from a said disease an effective amount of a mixture of β-sitosterol (BBS) and β-sitosterol glucoside (BSSG) in a ratio of from 1:1 to 200:1.

5,486,511

4-AMINO-17β-(CYCLOPROPYLOXY)ANDROST-4-EN-3-ONE, 4-AMINO-17β-(CYCLOPROPYLAMINO)ANDROST-4-EN-3-ONE AND RELATED COMPOUNDS AS C_{17-20} LYASE AND 5α-REDUCTASE

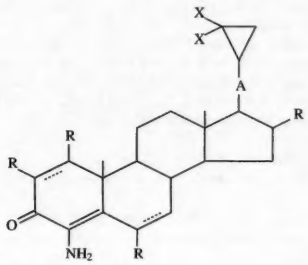
Philip M. Weintraub, Cincinnati; Cynthia A. Gates, Fairfield; Michael R. Angelastro; Timothy T. Curran, both of Cincinnati, and J. O'Neal Johnston, Milford, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 209,501, Mar. 16, 1994, abandoned, which is a continuation-in-part of Ser. No. 66,744, May 25, 1993, abandoned. This application May 2, 1994, Ser. No. 231,434

Int. Cl.[6] **A61K** *31/565;* **C07J** *1/00*

U.S. Cl. 514—178 **38 Claims**

1. A compound and the pharmaceutically acceptable salts of the formula:



wherein A is O or NH and each R is independently selected from the group consisting of hydrogen and C_1-C_4 lower alkyl; each X is independently selected from the group consisting of hydrogen, halogen, and methyl; and the dotted lines indicate the optional presence of a double bond.

5,486,512

QUINAZOLINE DERIVATIVES AS ACETYLCHOLINESTERASE INHIBITORS

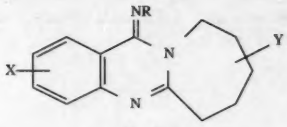
Vlad E. Gregor, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 911,662, Jul. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 736,888, Jul. 29, 1991, abandoned, Continuation of Ser. No. 911,662, Jul. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 736,888, Jul. 29, 1991, abandoned. This application Mar. 17, 1994, Ser. No. 214,911

Int. Cl.[6] **C07D** *487/04;* **A61K** *31/55*

U.S. Cl. 514—214 **11 Claims**

1. A compound of formula



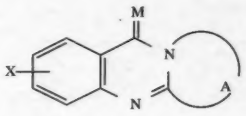
or a pharmaceutically acceptable salt thereof wherein

Y is hydrogen, hydroxy, carboxy, lower alkoxy, lower alkyl, keto, lower alkoxy carbonyl, or lower alkanoyl;

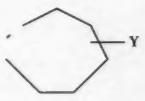
R is hydrogen, lower alkyl, lower alkenyl or lower alkynyl; and

X is absent or one to four substituents selected from halogen, lower alkyl, perfluorinated lower alkyl, hydroxy, carboxy, lower alkoxy, perfluorinated lower alkoxy, nitro, amino, lower alkanoyl amino and lower alkylcarbamoyloxy with the proviso that when Y is hydrogen and R is hydrogen, X is not absent.

8. A method of treating cognitive deficiencies through the inhibition of cholinesterase comprising administering to a mammal in need thereof a therapeutically effective amount in unit dosage form of a compound of the formula



wherein A is



in which Y is hydrogen, hydroxy, carboxy, lower alkoxy, lower alkyl, aryl, heteroaryl, keto, lower alkoxycarbonyl, or lower alkanoyl, or its corresponding oxime;

M is =S, =NR, or

in which R and R' are each independently hydrogen, hydroxy, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, aryl, aryloxy, aryllower alkyl, heteroaryl, or heteroaryllower alkyl and, when taken together, may form a three- to six-membered ring optionally containing one to three heteroatoms selected from nitrogen, oxygen, and sulfur; and

X is absent or one to four substituents selected form halogen, lower alkyl, lower alkenyl or lower alkynyl, amino, lower alkylamino or di-lower alkylamino, nitro, lower alkylthio, aryl-, or heteroarylthio, mercapto, hydroxy, carboxy, lower alkoxy, aryl- or heteroaryloxy, lower alkyl-, aryl- or heteroarylsulfinyl, lower alkyl-, aryl- or heteroarylsulfonyl, perfluoro-lower-alkyl, perfluoro-lower-alkoxy, perfluoro-lower-alkylthio, perfluoro-lower-alkylsulfinyl, perfluoro-lower-alkylsulfonyl, lower alkyl-, aryl- or heteroarylcarbamoyl, di-lower-alkanoylamino, lower alkyl- aryl- or heteroarylsulfinyl-amido, lower alkyl-, aryl- or heteroarylsulfonylamido, perfluoro-lower-alkylsulfinylamido, perfluoro-lower-alkyl-sulfonylamido, trialkylsilyl, lower alkanoyl, perfluoro-lower-alkanoyl-, loweralkanoyl-lower alkyl, perfluoro-lower-alkanoyl-lower alkyl, lower alkyl-, aryl- or heteroarylcarbamoyloxy, di-lower-alkyl-, diaryl- or diheteroarylcarbamoyloxy, lower alkyl-,aryl- or heteroarylcarbamoylthio, lower alkyl-, aryl or hetero-arylcarbamoyl-lower-

alkyl, imido-lower-alkyl, aryl, aryllower-alkyl, heteroaryl and heteroaryllower-alkyl; or a pharmaceutically acceptable acid addition salt thereof.

5,486,513

2-SUBSTITUTED INDANE-2-MERCAPTOACETYLAMIDE DERIVATIVES USEFUL AS INHIBITORS OR ENKEPHALINASE AND ACE

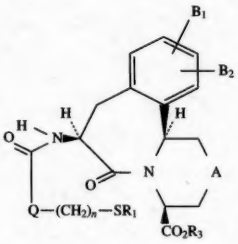
Alan M. Warshawsky, and Gary A. Flynn, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 146,646, Nov. 1, 1993, Pat. No. 5,428,158, which is a continuation-in-part of Ser. No. 929,481, Aug. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 767,286, Sep. 27, 1991, abandoned. This application Mar. 1, 1995, Ser. No. 396,947

Int. Cl.[6] A61K *31/55;* **C07D** *471/04*

U.S. Cl. 514—214 **1 Claim**

1. A composition comprising an assayable amount of a compound of the formula



wherein

B_1 and B_2 are each independently hydrogen; hydroxy; —OR_2 wherein R_2 is a C_1–C_4 alkyl or an Ar—Y group wherein Ar is a phenyl or naphthyl group unsubstituted or substituted with from one to three substituents selected from the group consisting of methylene dioxy, hydroxy, C_1–C_4 alkoxy, fluoro and chloro and Y is a hydrogen or C_1–C_4 alkyl; or, where B_1 and B_2 are attached to adjacent carbon atoms, B_1 and B_2 can be taken together with said adjacent carbons to form a benzene ring or methylenedioxy;

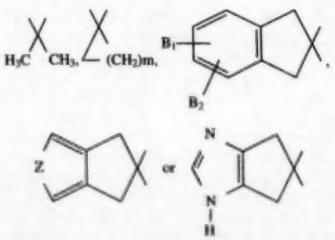
A is a bond, methylene, oxygen, sulfur, NR_4 or $NCOR_5$ wherein R_4 is hydrogen, a C_1–C_4 alkyl or an Ar—Y— group and R_5 is —CF_3, a C_1–C_{10} alkyl or an Ar—Y— group;

R_1 is hydrogen, acetyl, —$CH_2OC(O)C(CH_3)_3$ or benzoyl;

R_3 is hydrogen or —$CH_2OC(O)C(CH_3)_3$;

n is an integer 0 to 3; and

Q is a group of the formula



wherein Z is O, NH or S; and m is an integer 1 to 5 in admixture or otherwise in association with an inert carrier.

5,486,514

CARBAMATE DERIVATIVES

David Trist; Giorgio Pentassuglia; Maria E. Tranquillini, and Antonella Ursini, all of Verona, Italy, assignors to Glaxo SpA, Verona, Italy

PCT No. PCT/EP93/00099, § 371 Date Jul. 20, 1994, § 102(e) Date Jul. 20, 1994, PCT Pub. No. WO93/14075, PCT Pub. Date Jul. 22, 1993

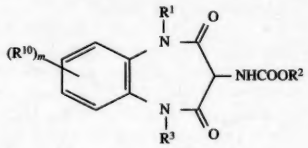
PCT Filed Jan. 15, 1993, Ser. No. 256,358

Claims priority, application United Kingdom, Jan. 21, 1992, 9201181

Int. Cl.[6] C07D *243/12;* **A61K** *31/55*

U.S. Cl. 514—221 **14 Claims**

1. A compound of general formula (I)



(I)

wherein

R^1 represents a phenyl, C_{3-7}cycloalkyl, bridged C_{7-11}cycloalkyl or C_{1-6}alkyl group which alkyl group may be substituted by a hydroxy, phenyl, C_{1-6}alkoxycarbonyl, C_{3-7}cycloalkyl or bridged C_{7-11}cycloalkyl group or R^1 represents the group XYR^4 wherein X is a C_{1-3} straight or branched alklene chain, Y is C═O, $C(OR^5)_2$ or $C(SR^5)$ and is a R^4 is a C_{1-6}alkyl, optionally substituted phenyl, C_{3-7}cycloalkyl or bridged C_{7-11}-cycloalkyl.

R^2 represents a substituted or unsubstituted phenyl (wherein the substitutents may be 1 or 2 of halo, C_{1-4}alkyl, nitro, cyano, trifluoromethyl, trifluoromethoxy C_{1-4}alkylthio or $(CH_2)_n$ R^6 wherein R^6 is hydroxy, C_{1-4}alkoxy, CO_2R^7 or NR^8R^9.

R^3 represents phenyl optionally substituted by one or two halogen atoms;

R^7 represents hydrogen or a C_{1-1}alkyl group;

R^8 and R^9 independently represent hydrogen or a C_{1-4}alkyl group.

R^{10} represents hydrogen or a halogen atom; m is zero, 1 or 2;

n is zero or 1; pharmaceutically acceptable salts and solvates thereof.

5,486,515

2-FLUOROALKYL-1,4-BENZOXAXINES AS POTASSIUM CHANNEL MEDIATORS

Frederick J. Brown; Keith Russell, both of Newark, and Paul J. Warwick, Jr., Wilmington, all of Del., assignors to Zeneca Limited, London, England

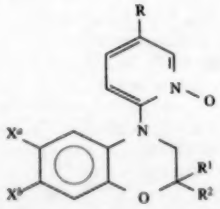
Filed May 9, 1994, Ser. No. 239,637

Claims priority, application United Kingdom, May 12, 1993, 9309716

Int. Cl.[6] A61K *31/535;* **C07D** *265/36;265/38*

U.S. Cl. 514—229.8 **11 Claims**

1. A compound of formula I:



(I)

wherein,

R is hydrogen or trifluoromethyl

R^1 and R^2 are independently selected from (1–3C)alkyl which may be substituted by one or more fluoro groups, provided that at least one of R^1 and R^2 is substituted by at least one fluoro group;

X^a is selected from

(A) cyano, nitro, trifluoromethyl, pentafluoroethyl, trifluoromethoxy, trifluoromethylsulfonyl, methylsulfonyl, halo trifluoromethylthio, and

(B) a group Y-Z connected to the benz ring through Z, wherein

Y is a 6-membered aromatic ring or heteroaromatic ring containing 1–2 nitrogens as the heteroatoms and is connected to Z through carbon, and

Z is selected from sulfonyl and carbonyl; and

X^b is selected from hydrogen, halogen, trifluoromethyl, trifluoromethylacetamido and (1–4C)alkoxy; or

X^a and X^b, together with the carbon atoms to which they are attached, form an 1-oxa-2,5-diazole, a 1-thia-2,5-diazole or a 1,2,5-triazole ring;

or a pharmaceutically acceptable salt of said compound.

5,486,516

FUROPYRIMIDINE DERIVATIVES

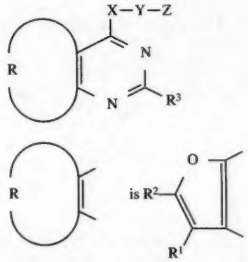
Ronnie G. Edie, Greenfield; Ronald E. Hackler, and Eriks V. Krumkalns, both of Indianapolis, all of Ind., assignors to DowElanco, Indianapolis, Ind.

Continuation of Ser. No. 927,759, Aug. 10, 1992, abandoned, which is a division of Ser. No. 502,364, Mar. 30, 1990, Pat. No. 5,137,879. This application Dec. 10, 1993, Ser. No. 166,268

Int. Cl.[6] **C07D** *49/048;* **A61K** *31/505;31/535*

U.S. Cl. 514—232.8 **6 Claims**

1. A compound of the formula (1)



(1)

R^1 is H, C_1–C_4 alkyl, or phenyl optionally substituted with halo, (C_1–C_4) alkyl, (C_1–C_4) alkoxy, halo (C_1–C_4) alkyl, or halo (C_1–C_4) alkoxy;

R^2 is H, (C_1–C_4) alkyl, nitro, halo; or

R^1 and R^2 combine to form —$(CH_2)_4$—;

R^3 is H, (C_1–C_4) alkyl, halo (C_1–C_4) alkyl, phenyl, or substituted phenyl;

X is O, or NR^4, where R^4 is H, (C_1–C_4) alkyl, or (C_1–C_4) alkanoyl,

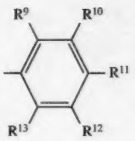
R^7 and R^8 are independently (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or substituted phenyl, and said hydrocarbon chain being optionally substituted with halo, hydroxy, or (C_1–C_4) alkanoyl; or

Y is —$(CH_2)_2$—; and

Z is

(a) (C_3–C_8) cycloalkyl or cycloalkenyl, optionally substituted with (C_1–C_4) alkyl, (C_1–C_4) alkoxy, halo (C_1–C_4) alkyl, halo (C_1–C_4) alkoxy, halo, hydroxy or (C_1–C_4) alkanoyl;

(b) a phenyl group of the formula (2)



(2)

where

R^9 to R^{13} are independently

H,

halo

I,

(C_3–C_8) cycloalkyl or -cycloalkenyl,

phenoxy, or

substituted phenoxy,

phenylthio, or substituted phenylthio,

phenyl, or substituted phenyl,

NO_2,

acetoxy,

OH,

CN,

$SiR^7R^8R^{14}$ or $OSiR^7R^8R^{14}$, where R^7, and R^8 are as defined above and R^{14} is (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or substituted phenyl,

$NR^{15}R^{16}$, where R^{15} and R^{16} are independently H, (C_1–C_4) alkyl, or (C_1–C_4) alkanoyl,

$S(O)R^{17}$, or SO_2R^{17}, where R^{17} is (C_1–C_{10}) alkyl, phenyl, or substituted phenyl

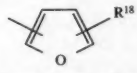
a C_1–C_{12} saturated or unsaturated hydrocarbon chain, straight chain or branched optionally including a hetero atom selected from O, S, SO, SO_2, NR^4, or SiR^7R^8 in place of one of the carbon atoms, where R^4, R^7 and R^8 are as defined above, and optionally substituted with halo, halo (C_1–C_4) alkoxy, hydroxy, (C_3–C_8) cycloalkyl or cycloalkenyl, (C_1–C_4) alkanoyl, phenoxy, substituted phenoxy, phenyl, substituted phenyl, phenylthio, or substituted phenylthio;

(C_1–C_7) alkoxy optionally substituted with halo, phenyl, substituted phenyl, (C_3–C_8) cycloalkyl or cycloalkenyl, phenoxy, or substituted phenoxy,

(C_1–C_7) alkylthio optionally substituted with halo, phenyl, substituted phenyl, (C_3–C_8) cycloalkyl or cycloalkenyl, phenoxy, or substituted phenoxy; or

R^{10} and R^{11} combine to form —O—CF_2—O— or —O—(CH_2)—O—;

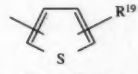
(c) a furyl group of formula (3)



(3)

where R^{18} is H, halo, halomethyl, CN, NO_2, (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, (C_1–C_4) alkoxy;

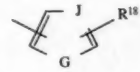
(d) a thienyl group of the formula (4)



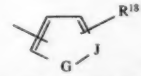
(4)

where R^{19} is R^{18} as defined in paragraph (c) or thienyl;

(e) a group of formula (5) or (6)



(5)

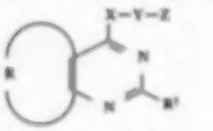


(6)

where R^{18} is as defined in paragraph (c), J is N or CH, and G is O, NR^{20}, or S, provided that if J is not N then G is NR^{20}, where R^{20} is H, (C_1–C_4) alkyl, (C_1–C_4) alkanoyl, phenylsulfonyl, or substituted phenylsulfonyl;

(f) a group selected from
naphthyl, dihydronaphthyl, tetrahydronaphthyl, and decahydronaphthyl;
pyridyl;
indolyl;
1,3-benzodioxolyl;
2,6-dimethyl-4-morpholinyl; and
1-adamantyl;
or an acid addition salt of a compound of formula (1);
where, in the foregoing definitions, the terms substituted phenyl, substituted phenoxy, substituted phenylthio and substituted phenylsulfonyl, refer to such groups wherein the phenyl ring is substituted with up to three groups selected from halo, I, (C_1–C_{10}) alkyl, branched (C_3–C_6) alkyl, halo (C_1–C_3) alkyl, hydroxy (C_1–C_3) alkyl, (C_1–C_3) alkoxy, halo (C_1–C_3) alkoxy, phenoxy, substituted phenoxy, phenyl, substituted phenyl, NO_2, OH, CN, (C_1–C_4) alkanoyloxy, or benzyloxy, provided that no substituted phenyl, phenoxy, phenylthio, or phenyl sulfinyl group includes more than three phenyl rings.

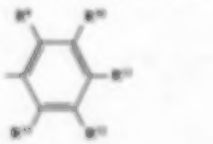
2. A compound of the formula (1)



(1)

where

R^1 is H, C_1–C_4 alkyl, or phenyl optionally substituted with halo, (C_1–C_3) alkyl, (C_1–C_4) alkoxy, halo (C_1–C_3) alkyl, or halo (C_1–C_3) alkoxy;
R^2 is H, (C_1–C_3) alkyl, nitro, halo; or
R^1 R^2 combine to form —$(CH_2)_4$—;
R^3 is H, (C_1–C_3) alkyl, halo (C_1–C_3) alkyl, phenyl, or substituted phenyl;
X is O, or NR^4, where R^4 is H, (C_1–C_3) alkyl, or (C_1–C_4) alkanoyl,
R^7 and R^8 are independently (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or substituted phenyl, and said hydrocarbon chain being optionally substituted with halo, hydroxy, or (C_1–C_4) alkanoyl; or
Y is —$(CH_2)_3$—; and
Z is
(a) (C_3–C_8) cycloalkyl or cycloalkenyl, optionally substituted with (C_1–C_4) alkyl, (C_1–C_4) alkoxy, halo (C_1–C_3) alkyl, halo (C_1–C_4) alkoxy, halo, hydroxy or (C_1–C_4) alkanoyl;
(b) a phenyl group of the formula (2)



(2)

where
R^{10} to R^{14} are independently
H,
halo
I,
(C_1–C_4) cycloalkyl or -cycloalkenyl,
phenoxy, or
substituted phenoxy,
phenylthio, or substituted phenylthio,
phenyl, or substituted phenyl,
NO_2,
acetoxy,
OH,
CN,
$SiR^7R^8R^{14}$ or $OSiR^7R^8R^{14}$, where R^7, and R^8 are as defined above and R^{14} is (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or substituted phenyl,
$NR^{15}R^{16}$, where R^{15} and R^{16} are independently H, (C_1–C_4) alkyl, or (C_1–C_4) alkanoyl,
$S(O)R^{17}$, or SO_2R^{17}, where R^{17} is (C_1–C_{10}) alkyl, phenyl, or substituted phenyl
a C_1–C_{12} saturated or unsaturated hydrocarbon chain, straight chain or branched optionally including a hetero atom selected from O, S, SO, SO_2, NR^4, or SiR^7R^8 in place of one of the carbon atoms, where R^4, R^7 and R^8 are as defined above, and optionally substituted with halo, halo (C_1–C_4) alkoxy, hydroxy, (C_3–C_8) cycloalkyl or cycloalkenyl, (C_1–C_4) alkanoyl, phenoxy, substituted phenoxy, phenyl, substituted phenyl, phenylthio, or substituted phenylthio;
(C_1–C_3) alkoxy optionally substituted with halo, phenyl, substituted phenyl, (C_3–C_8) cycloalkyl or cycloalkenyl, phenoxy, or substituted phenoxy,
(C_1–C_3) alkylthio optionally substituted with halo, phenyl, substituted phenyl, (C_3–C_8) cycloalkyl or cycloalkenyl, phenoxy, or substituted phenoxy; or
R^{10} and R^{11} combine to form —O—CF_2—O— or —O(CH_2)—O—;
(c) a furyl group o f formula (3)

(3)

where R^{19} is H, halo, halomethyl, CN, NO_2, (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, (C_1–C_4) alkoxy;
(d) a thienyl group of the formula (4)

(4)

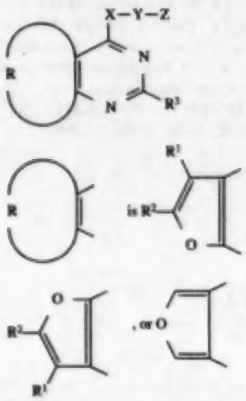
where R^{19} is R^{18} as defined in paragraph (c) or thienyl;
(e) a group of formula (5) or (6)

(5)

(6)

where R^{19} is as defined in paragraph (c), J is N or CH, and G is O, NR^{20}, or S, provided that if J is not N then G is NR^{20}, where R^{20} is H, (C_1–C_4) alkyl, (C_1–C_4) alkanoyl, phenylsulfonyl, or substituted phenylsulfonyl;
(f) a group selected from
naphthyl, dihydronaphthyl, tetrahydronaphthyl, and decahydronaphthyl;
pyridyl;
indolyl;
1,3-benzodioxolyl;
2,6-dimethyl-4-morpholinyl; and
1-adamantyl;
or an acid addition salt of a compound of formula (1);
where, in the foregoing definitions, the terms substituted phenyl, substituted phenol, substituted phenylthio and substituted phenylsulfonyl, refer to such groups wherein the phenyl ring is substituted with up to three groups selected from halo, I, (C_1–C_{10}) alkyl, branched (C_3–C_6) alkyl, halo (C_1–C_3) alkyl, hydroxy (C_1–C_3) alkyl, (C_1–C_3) alkoxy, halo (C_1–C_3) alkoxy, phenol, substituted phenoxy, phenyl, substituted phenyl, NO_2, OH, CN, (C_1–C_4) alkanoyloxy, or benzyloxy, provided that no substituted phenyl, phenoxy, phenylthio, or phenyl sulfinyl group includes more than three phenyl rings.

3. A compound of the formula (1)



(1)

R^1 is H, C_1–C_4 alkyl, or phenyl optionally substituted with halo, (C_1–C_4) alkyl, (C_1–C_4) alkoxy, halo (C_1–C_4) alkyl, or halo (C_1–C_4) alkoxy;

R^2 is H, (C_1–C_4) alkyl, nitro, halo; or

R^1 and R^2 combine to form —$(CH_2)_4$—;

R^3 is H, (C_1–C_4) alkyl, halo (C_1–C_4) alkyl, phenyl, or substituted phenyl;

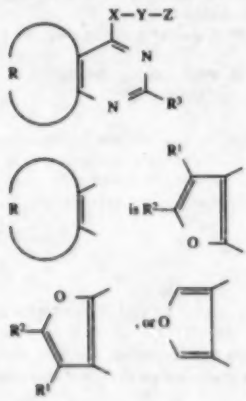
X is O, or NR^4, where R^4 is H, (C_1–C_4) alkyl, or (C_1–C_4) alkanoyl,

Y is —$(CH_2)_2$—; and

Z is 2-naphthalene;

or an acid addition salt of a compound of formula (1).

4. A compound of the formula (1)



(1)

R^1 is H, C_1–C_4 alkyl, or phenyl optionally substituted with halo, (C_1–C_4) alkyl, (C_1–C_4) alkoxy, halo (C_1–C_4) alkyl, or halo (C_1–C_4) alkoxy;

R^2 is H, (C_1–C_4) alkyl, nitro, halo; or

R^1 and R^2 combine to form —$(CH_2)_4$—;

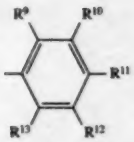
R^3 is H, (C_1–C_4) alkyl, halo (C_1–C_4) alkyl, phenyl, or substituted phenyl;

X is O;

R^7 and R^8 are independently (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or substituted phenyl, and said hydrocarbon chain being optionally substituted with halo, hydroxy, or (C_1–C_4) alkanoyl; or

Y is —$(CH_2)_2$—; and

Z is a phenyl group of the formula (2)



(2)

where

R^9 to R^{13} are independently

H,

halo

I,

(C_3–C_8) cycloalkyl or -cycloalkenyl,

phenoxy, or

substituted phenoxy,

phenylthio, or substituted phenylthio,

phenyl, or substituted phenyl,

NO_2,

acetoxy,

OH,

CN,

$SiR^7R^8R^{14}$ or $OSiR^7R^8R^{14}$, where R^7, and R^8 are as defined above and R^{14} is (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or substituted phenyl,

$NR^{15}R^{16}$, where R^{15} and R^{16} are independently H, (C_1–C_4) alkyl, or (C_1–C_4) alkanoyl,

$S(O)R^{17}$, or SO_2R^{17}, where R^{17} is (C_1–C_{10}) alkyl, phenyl, or substituted phenyl

a C_1–C_{12} saturated or unsaturated hydrocarbon chain, straight chain or branched optionally including a hetero atom selected from O, S, SO, SO_2, NR^4, or SiR^7R^8 in place of one of the carbon atoms, where R^4, R^7 and R^8 are as defined above, and optionally substituted with halo, halo (C_1–C_4) alkoxy, hydroxy, (C_3–C_8) cycloalkyl or cycloalkenyl, (C_1–C_4) alkanoyl, phenoxy, substituted phenoxy, phenyl, substituted phenyl, phenylthio, or substituted phenylthio;

(C_1–C_7) alkoxy optionally substituted with halo, phenyl, substituted phenyl, (C_3–C_8) cycloalkyl or cycloalkenyl, phenoxy, or substituted phenoxy,

(C_1–C_7) alkylthio optionally substituted with halo, phenyl, substituted phenyl, (C_3–C_8) cycloalkyl or cycloalkenyl, phenoxy, or substituted phenoxy; or

R^{10} and R^{11} combine to form —O—CF_2—O— or —O—(CH_2)—O—;

or an acid addition salt of a compound of formula (1).

where, in the foregoing definitions, the terms substituted phenyl, substituted phenoxy, substituted phenylthio and substituted phenylsulfonyl, refer to such groups wherein the phenyl ring is substituted with up to three groups selected from halo, I, (C_1–C_{10}) alkyl, branched (C_3–C_8) alkyl, halo (C_1–C_7) alkyl, hydroxy (C_1–C_7) alkyl, (C_1–C_7) alkoxy, halo (C_1–C_7) alkoxy, phenoxy, substituted phenoxy, phenyl, substituted phenyl, NO_2, OH, CN, (C_1–C_4) alkanoyloxy, or benzyloxy, provided that no substituted phenyl, phenoxy, phenylthio, or phenyl sulfonyl group includes more than three phenyl rings.

5,486,517

BENZIMIDAZOLES AND IMIDAZOPYRIDINES AS CENTRAL NERVOUS SYSTEM AGENTS

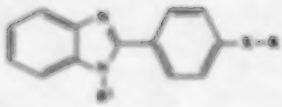
Dennis M. Downing; Shelly A. Glase; Stephen J. Johnson; Lawrence D. Wise, and Jonathan L. Wright, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 10, 1994, Ser. No. 240,355

Int. Cl.[6] **A61K** *31/495;31/505;* **C07D** *403/10;403/12*

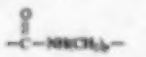
U.S. Cl. 514—253 **5 Claims**

1. A compound of Formula I

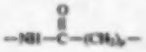


wherein E is

wherein R^1 is aryl, or heteroaryl;
R^2 is hydrogen, or alkyl of from 1 to 6 carbon atoms;
X is -Y- $(CH_2)_n$-
wherein Y is O, S or NH, and n is an integer from 2 to5,

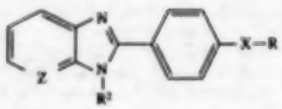


wherein p is an integer from 1 to 4,

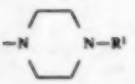


wherein p is as defined above,
alkyl of from 3 to 6 carbon atoms,
alkenyl of from 3 to 6 carbon atoms,
alkynyl of from 3 to 6 carbon atoms;
and corresponding cis or trans isomers or mixtures of cis and trans isomers thereof; or a pharmaceutically acceptable acrid addition salt thereof.

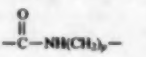
5. A method of treating schizophrenia comprising administering to a host suffering therefrom a therapeutic effective amount of a compound of Formula I



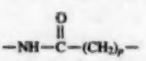
wherein R is



wherein R^1 is aryl, or heteroaryl;
R^2 is hydrogen, or alkyl of from 1 to 6 carbon atoms;
X is -Y- $(CH_2)_n$-
wherein Y is O, S or NH, and n is an integer from 2 to 5,



wherein p is an integer from 1 to 4,



wherein p is as defined above,
alkyl of from 3 to 6 carbon atoms,
alkenyl of from 3 to 6 carbon atoms,
alkynyl of from 3 to 6 carbon atoms;
Z is N or CH;
and corresponding cis or trans isomers or mixtures of cis and trans isomers thereof; or a pharmaceutically acceptable acid addition salt thereof in unit dosage form.

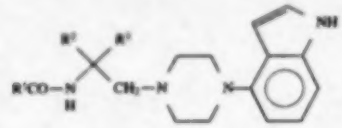
5,486,518

4-INDOLYLPIPERAZINYL DERIVATIVES

John P. Yardley, King of Prussia; Horace Fletcher, III, Pottstown, both of Pa.; Michael G. Kelly, Maidenhead, and Alan C. White, Surrey, both of, England, assignors to American Home Products Corporation, Madison, N.J.

Filed Apr. 10, 1995, Ser. No. 419,342
Int. Cl.[6] A61K *31/495*; **C07D** *403/00*
U.S. Cl. 514—254 **10 Claims**

1. A compound of the formula:



in which
R^1 is alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, aryl of 6 to 10 carbon atoms or arylalkyl of 7 to 12 carbon atoms;
R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;
R^3 is phenyl, benzyl, substituted phenyl, or substituted benzyl in which the substituents are hydroxy, halo, alkoxy of 1 to 6 carbon atoms, trifluoromethyl, nitro, cyano, alkoxycarbonyl of 2 to 7 carbon atoms, amino or dialkylamino, each alkyl group having 1 to 6 carbon atoms;
or a pharmaceutically acceptable salt thereof.

5,486,519

METHOD FOR TREATMENT OF ACUTE RENAL FAILURE

James E. Greenwald, 100 N. Euclid Ave., Ste. 902, St. Louis, Mo. 63108

Filed Aug. 22, 1994, Ser. No. 293,989
Int. Cl.[6] A61K *31/505*
U.S. Cl. 514—258 **4 Claims**

1. A method for the treatment of acute renal failure comprising administering to a warm-blooded mammal manifesting acute renal failure a small but effective amount of zaprinast sufficient to effect acceleration of the recovery from said acute renal failure.

5,486,520

1,3-OXATHIOLANES USEFUL IN THE TREATMENT OF HEPATITIS

Bernard Belleau, deceased, late of Quebec, and Nghe Nguyen-Ba, Quebec, both of, Canada, assignors to BioChemPharma, Inc., Laval, Canada

Continuation of Ser. No. 884,729, May 15, 1992, abandoned. This application Dec. 10, 1993, Ser. No. 166,320
Claims priority, application United Kingdom, May 20, 1991, 9110874
Int. Cl.[6] A01N *43/54*; **A61K** *31/505*
U.S. Cl. 514—274 **10 Claims**

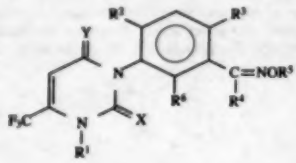
1. A method for the treatment of hepatitis B infections in animals, including humans, comprising the step of administering, in an amount effective to inhibit viral replication, a compound selected from the group consisting of
cis-2-hydroxymethyl-5-(5'-fluorocytosin-1'-yl)-1,3-oxathiolane;
trans-2-hydroxymethyl-5-(5'-fluorocytosin-1'-yl)-1,3-oxathiolane; and mixtures thereof;
or pharmaceutically acceptable derivatives thereof.

5,486,521
PYRIMIDINYL ARYL KETONE OXIMES

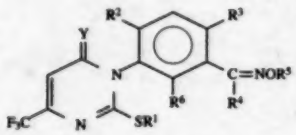
Walter G. Brouwer, Guelph, Canada; Alan W. Dalrymple, Lindale, Tex.; Ethel E. Felauer, Puslinch, Canada, and Paul T. McDonald, Middlebury, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.; Uniroyal Chemical Ltd., Elmira, Canada, and Ltee, New Jersey, Canada

Filed Mar. 21, 1994, Ser. No. 216,207
Int. Cl.[6] C07D *239/54;239/56;* **A61K** *31/505*
U.S. Cl. 514—274 **9 Claims**

1. An insecticidally-active compound of structural formula I, Ia or Ib shown below wherein:

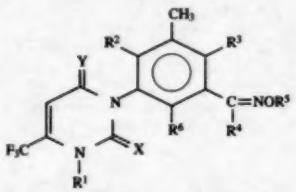


(I)



(Ia)

AND



(Ib)

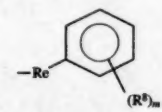
R^1 is hydrogen; C_1–C_6 hydrocarbyl; hydroxymethyl; alkaline earth metal; or organic base salt;

R^2 and R^6 are independently either hydrogen; halogen; or C_1–C_4 hydrocarbyl;

R^3 is either hydrogen; C_1–C_6 straight chain alkoxy, branched chain alkoxy or cyclic alkoxy; C_3–C_6 straight chain alkenyloxy, branched chain alkenyloxy or cyclic alkenyloxy; C_1–C_6 straight chain alkylthio or branched chain alkylthio; or C_1–C_6 hydrocarbyl; and provided that R^3 is not trifluoro methyl;

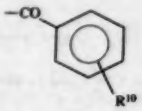
R^4 is either hydrogen or C_1–C_4 hydrocarbyl;

R^5 is either 2-tetrahydrofuranylmethyl or C_1–C_6 hydrocarbyl; and wherein R^5 may be substituted either with C_1–C_4 linear alkoxy or branched alkoxy, or with trimethylsilyl, or with C_1–C_6 hydrocarbyl substituted with up to eleven (11) halogen atoms; or wherein R^5 may be the group $Re—CO_2—R^7$ wherein Re can be a C_1–C_3 alkylidene moiety and either may be substituted with C_1–C_6 linear alkyl groups or branched alkyl groups, or with from one (1) to six (6) halogen atoms; and wherein R^7 either is C_1–C_6 hydrocarbyl, or is the aromatic structural group shown immediately below



wherein Re is as defined above; and wherein $(R^8)_m$ is defined as follows

m is an integer between 0 and 5 and R^8 may be independently selected from halogen; nitro; cyano; carboxy; C_1–C_4 alkoxy; C_1–C_3 alkoxycarbonyl; or C_1–C_4 hydrocarbyl; or the group $ReCOR^9$ wherein Re is as defined above; and wherein R^9 is C_1–C_4 hydrocarbyl; phenyl substituted with C_1–C_4 hydrocarbyl; phenyl substituted with C_1–C_4 linear alkoxy or branched alkoxy; phenyl substituted with C_1–C_4 alkyl; phenyl substituted with halogen; or is the aromatic structural group shown immediately below



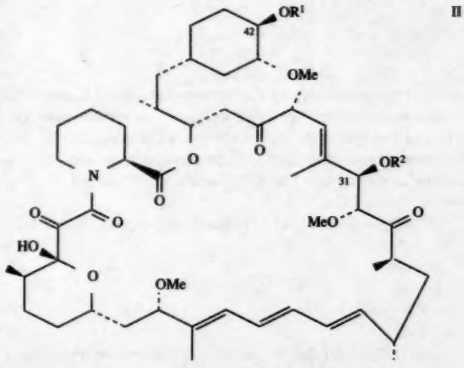
wherein R^{10} is C_1–C_4 linear alkoxy or branched alkoxy; C_1–C_4 hydrocarbyl; or halogen; and wherein X and Y are independently sulfur or oxygen.

5,486,522
CARBAMATES OF RAPAMYCIN

Amedeo A. Failli, Princeton Junction, N.J.; Oleg I. Bleyman, Holland, Pa.; Wenling Kao, Paoli, Pa., and Magid A. Abou-Gharbia, Glen Mills, Pa., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 284,764, Aug. 2, 1994, which is a continuation-in-part of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application May 24, 1995, Ser. No. 448,709
Int. Cl.[6] A61K *31/395;* **C07D** *498/16*
U.S. Cl. 514—291 **1 Claim**

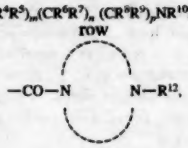
1. A method of treating transplantation rejection or graft vs. host disease in a mammal in need thereof, which comprises administering to said mammal an antirejection effective amount of a compound of the structure



II

wherein R^1 and R^2 are each, independently, hydrogen,

row —$CONR^3(CR^4R^5)_m(CR^6R^7)_n(CR^8R^9)_pNR^{10}R^{11}$, row



or —$CONR^3R^{13}$;

R^3 is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

R^4, R^5, R^8, and R^9 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, —OH, —CF_3, or —F;

R^6 is hydrogen or —OR^{14};

R^7 is hydrogen or alkyl of 1–6 carbon atoms;

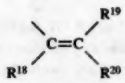
R^{10} is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

R^{11}, R^{12}, and R^{13} are each, independently, —$(CR^{15}R^{16})_rR^{17}$;

R^{14} is hydrogen, alkyl of 1–6 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silyl, tri-(alkyl of 1–6 carbon atoms)silylethyl, triphenylmethyl, benzyl, alkoxymethyl of 2–7 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silylethoxymethyl, or tetrahydropyranyl;

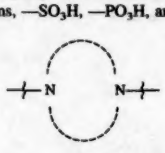
R^{15} and R^{16} are each, independently, hydrogen or alkyl of 1–6 carbon atoms;

R^{17} is



or —C≡C—R^{21};

R^{18}, R^{19}, R^{20}, and R^{21} are each, independently, hydrogen, alkyl of 1–6 carbon atoms, halogen, or phenyl, wherein the phenyl group may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, trifluoroalkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO_3H, —PO_3H, and —CO_2H;



is a 5–7 membered saturated or partially unsaturated heterocyclic radical containing at least 2 ring nitrogens, wherein the heterocyclic ring may optionally contain NR^{22} in the heterocyclic ring, and the ring carbons may optionally be substituted by alkyl of 1–6 carbon atoms, arylalkyl of 4–10 carbon atoms, halogen, —CF_3, —OR^{14}, or —CO_2R^{10};

R^{22} is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

m=0–6;

n=1–6;

p=0–6; and

r=1–6

with the proviso that R^1 and R^2 are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,486,523

CARBAMATES OF RAPAMYCIN

Amedeo A. Failli, Princeton Junction, N.J.; Oleg I. Bleyman, Holland, Pa.; Wenling Kao, Paoli, and Magid A. Abou-Gharbia, Glen Mills, Pa., assignors to American Home Products Corporation, Madison, N.J.

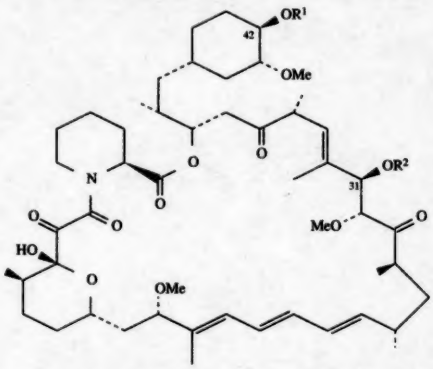
Division of Ser. No. 284,764, Aug. 2, 1994, which is a continuation-in-part of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application May 24, 1995, Ser. No. 449,444

Int. Cl.[6] A61K *31/395*; **C07D** *498/16*

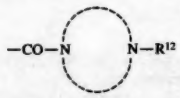
U.S. Cl. 514—291 **1 Claim**

1. A method of treating pulmonary inflammation in a mammal in need thereof, which comprises administering to said mammal an antiinflammatory effective amount of a compound of the structure

II



wherein R^1 and R^2 are each, independently, hydrogen, —$CONR^3(CR^4R^5)_m(CR^6R^7)_n(CR^8R^9)_pNR^{10}R^{11}$,



or $CONR^3R^{13}$;

R^3 is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

R^4, R^5, R^8, and R^9 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, —OH, —CF_3, or —F;

R^6 is hydrogen or —OR^{14};

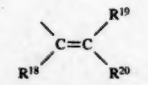
R^7 is hydrogen or alkyl of 1–6 carbon atoms;

R^{10} is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

R^{11}, R^{12}, and R^{13} are each, independently, —$(CR^{15}R^{16})_rR^{17}$;

R^{14} is hydrogen, alkyl of 1–6 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silyl, tri-(alkyl of 1–6 carbon atoms)silylethyl, triphenylmethyl, benzyl, alkoxymethyl of 2–7 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silylethoxymethyl, or tetrahydropyranyl;

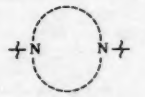
R^{15} and R^{16} are each, independently, hydrogen or alkyl of 1–6 carbon atoms;



or —C≡C—R^{21};

R^{18}, R^{19}, R^{20}, and R^{21} are each, independently, hydrogen, alkyl of 1–6 carbon atoms, halogen, or phenyl, wherein the phenyl group may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of

7–10 carbon atoms, alkoxy of 1–6 carbon atoms, trifluoroalkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO_3H, —PO_3H, and —CO_2H;



is a 5–7 membered saturated or partially unsaturated heterocyclic radical containing at least 2 ring nitrogens, wherein the heterocyclic ring may optionally contain NR^{22} in the heterocyclic ring, and the ring carbons may optionally be substituted by alkyl of 1–6 carbon atoms, arylalkyl of 4–10 carbon atoms, halogen, —CF_3, —OR^{14}, or —CO_2R^{10};

R^{22} is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

m=0–6;

n=1–6;

p=0–6; and

r=1–6

with the proviso that R^1 and R^2 are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,486,524

CARBAMATES OF RAPAMYCIN

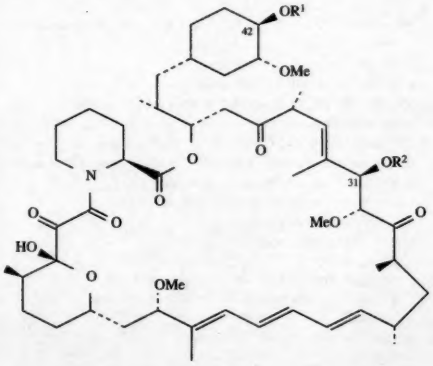
Amedeo A. Failli, Princeton Junction, N.J.; Oleg I. Bleyman, Holland, Pa.; Wenling Kao, Paoli, Pa., and Magid A. Abou-Gharbia, Glen Mills, Pa., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 284,764, Aug. 2, 1994, which is a continuation-in-part of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application May 24, 1995, Ser. No. 449,166

Int. Cl.[6] A61K *31/395;* **C07D** *498/16*

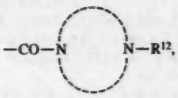
U.S. Cl. 514—291 **1 Claim**

1. A method of treating restenosis in a mammal in need thereof, which comprises administering to said mammal an antiproliferative effective amount of a compound of the structure



II

wherein R^1 and R^2 are each, independently, hydrogen, —$CONR^3(CR^4R^5)_m(CR^6R^7)_n(CR^8R^9)_pNR^{10}R^{11}$,



or $CONR^3R^{13}$;

R^3 is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

R^4, R^5, R^8, and R^9 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, —OH, —CF_3, or —F;

R^6 is hydrogen or —OR^{14};

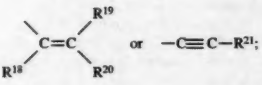
R^7 is hydrogen or alkyl of 1–6 carbon atoms;

R^{10} is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

R^{11}, R^{12}, and R^{13} are each, independently, —$(CR^{15}R^{16})_rR^{17}$;

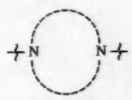
R^{14} is hydrogen, alkyl of 1–6 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silyl, tri-(alkyl of 1–6 carbon atoms)silylethyl, triphenylmethyl, benzyl, alkoxymethyl of 2–7 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silylethoxymethyl, or tetrahydropyranyl;

R^{15} and R^{16} are each, independently, hydrogen or alkyl of 1–6 carbon atoms;



or —$C{\equiv}C—R^{21}$;

R^{18}, R^{19}, R^{20}, and R^{21} are each, independently, hydrogen, alkyl of 1–6 carbon atoms, halogen, or phenyl, wherein the phenyl group may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, trifluoroalkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO_3H, —PO_3H, and —CO_2H;



is a 5–7 membered saturated or partially unsaturated heterocyclic radical containing at least 2 ring nitrogens, wherein the heterocyclic ring may optionally contain NR^{22} in the heterocyclic ring, and the ring carbons may optionally be substituted by alkyl of 1–6 carbon atoms, arylalkyl of 4–10 carbon atoms, halogen, —CF_3, —OR^{14}, or —CO_2R^{10};

R^{22} is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

m=0–6;

n=1–6;

p=0–6; and

r=1–6

with the proviso that R^1 and R^2 are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,486,525

PLATELET ACTIVATING FACTOR ANTAGONISTS: IMIDAZOPYRIDINE INDOLES

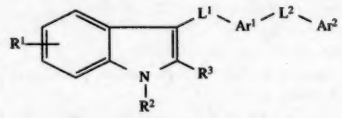
James B. Summers, Jr.; Steven K. Davidsen, both of Libertyville; Michael L. Curtin, Lindenhurst; H. Robin Heyman, Chicago; George S. Sheppard, Wilmette; Lianhong Xu, Libertyville; George M. Carrera, Jr., Des Plaines, and Robert B. Garland, Northbrook, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 324,631, Oct. 18, 1994, which is a continuation-in-part of Ser. No. 168,564, Dec. 16, 1993, abandoned. This application Dec. 5, 1994, Ser. No. 347,528

Int. Cl.[6] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—303 **10 Claims**

1. A compound of formula



or a pharmaceutically acceptable salt thereof wherein

R^1 is one or more groups independently selected from the group consisting of

hydrogen,

halogen,

hydroxy,

cyano,

alkyl of one to six carbon atoms,

alkynyl of two to four carbon atoms,

alkoxy of one to six carbon atoms,

alkanoyl of one to seven carbon atoms,

—$COOR^6$, wherein R^6 is hydrogen, alkyl of one to ten carbon atoms, or phenylalkyl wherein the alkyl portion is of one to four carbon atoms,

unsubstituted phenyl,

phenyl, substituted with

alkyl of one to six carbon atoms,

alkoxy of one to six carbon atoms,

halogen,

—NR^4R^5, where R^4 and R^5 are independently selected from hydrogen and alkyl of one to six carbon atoms, or R^4 and R^5 together with the nitrogen atom to which they are attached form a pyrrolidinyl, piperidinyl, piperazinyl, or morpholinyl ring,

—$COOR^6$,

—$C(O)NR^4R^5$, or

—$SO_2NR^4R^5$,

—$C(O)NR^4R^5$,

—$OC(O)NR^4R^5$,

—$NHC(O)NR^4R^5$,

2- or 3-furyl,

2- or 3-thienyl,

2-, 4-, or 5-thiazolyl

2-, 3-, or 4-pyridyl,

2-, or 4-pyrimidyl,

phenylalkyl in which the alkyl portion is of one to six carbon atoms,

phenylalkyl, in which the alkyl portion is of one to six carbon atoms and the phenyl moiety is substituted with

halogen,

alkyl of from one to six carbon atoms, or

alkoxy of from one to six carbon atoms,

unsubstituted benzoyl,

benzoyl substituted with

halogen,

alkyl of from one to six carbon atoms, or

alkoxy of from one to six carbon atoms,

unsubstituted phenoxy,

phenoxy substituted with

halogen,

alkyl of from one to six carbon atoms, or

alkoxy of from one to six carbon atoms,

unsubstituted phenylalkyloxy, in which the alkyl portion is of one to six carbon atoms,

phenylalkyloxy in which the alkyl portion is of one to six carbon atoms and the phenyl moiety is substituted with

halogen,

alkyl of from one to six carbon atoms, or

alkoxy of from one to six carbon atoms, and

unsubstituted phenylalkanoyl, in which the alkanoyl portion is of one to seven carbon atoms,

phenylalkanoyl, in which the alkanoyl portion is of one to seven carbon atoms and the phenyl moiety is substituted with;

halogen,

alkyl of from one to six carbon atoms, or

alkoxy of from one to six carbon atoms;

R^2 is selected from the group consisting of

hydrogen,

alkyl of one to six carbon atoms;

—$(CH_2)_pCOOR^6$, where p 0, 1, 2, 3, or 4,

—$(CH_2)_qNR^4R^5$, where q 2, 3, or 4,

—$(CH_2)_pCOR^6$

—$(CH_2)_qOR^6$,

—$(CH_2)_pSO_2R^6$,

—$(CH_2)_pSO_2NR^4R^5$,

—$(CH_2)_pCONR^7R^8$, where R^7 and R^8 are independently selected from the group consisting of

hydrogen,

alkyl of one to six carbon atoms,

—$(CH_2)_rCOOR^6$, where r is 1, 2, 3, or 4,

—$(CH_2)_rNR^4R^5$,

—$(CH_2)_rOH$,

—$(CH_2)_rSO_2R^6$, and

—$(CH_2)_rSO_2NR^4R^5$,

—$(CH_2)_pCN$

—$(CH_2)_p$-1H-tetrazol-5-yl

—$CONHNH_2$, and;

unsubstituted phenylalkyl wherein the alkyl portion is of one to four carbon atoms, and

phenylakyl wherein the alkyl portion is of one to four carbon atoms and the phenyl moiety is substituted with

halogen,

alkyl of from one to six carbon atoms, or

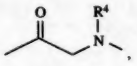
alkoxy of from one to six carbon atoms; or

R^7 and R, taken together with the nitrogen atom to which they are attached, for a pyrrolidinyl or morpholinyl ring;

R^3 is selected from the group consisting of hydrogen and alkyl of one to six carbon atoms;

L^1 is selected from the group consisting of

>C=O,



>C=NNR^9R^{10}, where R^9 and R^{10} are independently selected from

hydrogen,

alkyl of one to six carbon atoms,

alkoxycarbonyl of from one to six carbon atoms,

aminocarbonyl,

alkylaminocarbonyl of one to six carbon atoms,

dialkylaminocarbonyl in which the alkyl groups are independently of one to six carbon atoms,

alkanoyl of one to six carbon atoms,

unsubstituted phenyl, and

phenyl substituted with

halogen,

alkyl of from one to six carbon atoms, or

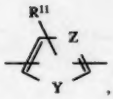
alkoxy of from one to six carbon atoms; and

>C=NOR^9,

>$S(O)_n$, wherein n is 1 or 2, and

—$NHSO_2$—;

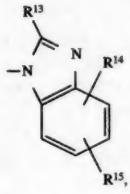
Ar^1 is a radical of formula

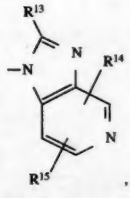


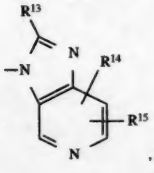
where Y is O, S, or —CH=CH—, Z is N or CH, and R^{11} is selected from the group consisting of
hydrogen,
alkyl of one to six carbon atoms,
alkenyl of two to six carbon atoms,
alkoxy of one to six carbon atoms, and
halogen;

L^2 is selected from the group consisting of
a valence bond,
unsubstituted straight-chain alkylene of one to six carbon atoms,
straight-chain alkylene of one to six carbon atoms substituted with one or more groups selected from
alkyl of one to six carbon atoms,
alkenyl of two to six carbon atoms,
alkoxycarbonyl of one to six carbon atoms,
alkoxy of one to six carbon atoms,
alkylthio of one to six carbon atoms,
alkoxyalkyl in which the two alkyl portions each are of one to six carbon atoms,
alkylthioalkyl in which the alkoxy and alkyl portions are independently of one to six carbon atoms,
unsubstituted phenylalkyl wherein the alkyl portion is of one to six carbon atoms,
phenylalkyl wherein the alkyl portion is of one to six carbon atoms, and the phenyl ring is substituted with alkyl of one to six carbon atoms, haloalkyl of one to six carbon atoms, alkoxy of one to six carbon atoms, hydroxy, or halogen,
unsubstituted thiophenyl, and
thiophenyl substituted with alkyl of one to six carbon atoms, haloalkyl of one to six carbon atoms, alkoxy of one to six carbon atoms, hydroxy, or halogen,
with the proviso that L^2 is unsubstituted alkylene or alkylene substituted alkyl when Ar^1 is a valence bond;

Ar^2 is selected from the group consisting of







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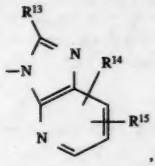
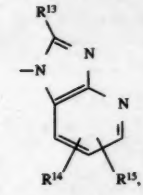
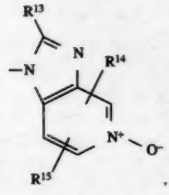
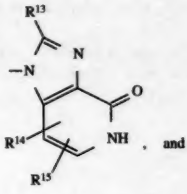
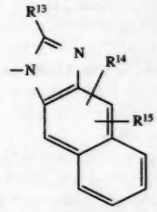








and



where R^{13} is selected from the group consisting of
alkyl of one to six carbon atoms,
alkenyl of two to six carbon atoms,
alkoxy of one to six carbon atoms,
alkylthio of one to six carbon atoms,
alkoxyalkyl in which the alkoxy and alkyl portions are independently of one to six carbon atoms,
alkylthioalkyl in which the alkyl portions each independently of one to six carbon atoms,
haloalkyl of one to six carbon atoms, unsubstituted phenylalkyl wherein the alkyl portion is of one to six carbon atoms,
phenylalkyl wherein the alkyl portion io of one to six carbon atoms and the phenyl is substituted with
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms,
alkoxy of one to six carbon atoms,
hydroxy, or
halogen,
cycloalkyl of three to eight carbon atoms,

unsubstituted thiophenyl, and
thiophenyl substituted with
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms,
alkoxy of one to six carbon atoms,
hydroxy, or
halogen, and

R^{14} and R^{15} are independently selected from the group consisting of
hydrogen,
alkyl of one to six carbon atoms,
alkenyl of two to six carbon atoms,
halogen,
cyano,
carboxyl,
alkoxycarbonyl of two to six carbon atoms,
aminocarbonyl,
alkylaminocarbonyl of two to six carbon atoms,
dialkylaminocarbonyl in which the alkyl groups are independently of one to six carbon atoms,
alkanoyl,
hydroxyalk,
haloalkyl,
alkoxy of one to six carbon atoms,
alkylthio of one to six carbon atoms,
alkylsulfinyl of one to six carbon atoms,
alkylsulfonyl of one to six carbon atoms,
amino,
alkonylamino, of one to six carbon atoms, and
nitro, or

R^{14} and R^{15}, together with the carbon atoms to which they are attached define a phenyl ring or 5- to 7-membered cycloalkylene ring.

5,486,526

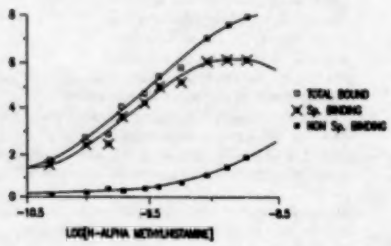
HISTAMINE H_3-RECEPTOR ANTAGONISTS AND THERAPEUTIC USES THEREOF

Graham J. Durant, Marshfield, Mass.; Amin M. Khan, Toledo, and Clark E. Tedford, S. Russell, both of Ohio, assignors to The University of Toledo, Toledo, and Gliatech, Inc., Beachwood, both of Ohio

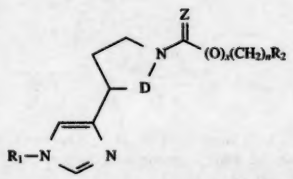
Continuation-in-part of Ser. No. 862,657, Apr. 1, 1992, abandoned. This application Oct. 29, 1993, Ser. No. 145,903

Int. Cl.[6] **C07D** *411/00;211/06;233/00;* **A01N** *43/40*

U.S. Cl. 514—319 **9 Claims**



1. A method of suppressing appetite in a subject comprising administering to an animal, in whom appetite suppression is desirnd, an effective amount of a compound of the formula:



I

wherein R_1 represents hydrogen, an in vivo hydrolyzable group, an alkyl group., a cyclic alkyl group, or an aryl group; D is CH_2 or C_2CH_2; Z is S or O; x is 0 or 1; n is an integer from 0 to 6; and R_2 represents a substituted or unsubstituted linear chain or branched chain alkyl group of up to about 20 carbon atoms, a substituted or unsubstituted carbocyclic group of up to about 20 atoms, or a substituted or unsubstituted aryl group of up to about 20 carbon atoms, and salts thereof, with the provisos that if R_2 is tert-butyl, cyclohexyl, or dicyclohexylmethyl, x or n must not be 0; and if R_2 is adamantane, the sum of x and n must be greater than 1;. or a pharmaceutically acceptable salt thereof.

5,486,527

ANTICHOLINERGIC AGENTS

David Alker, Birchington, and Peter E. Cross, Canterbury, both of, England, assignors to Pfizer Inc., New York, N.Y.

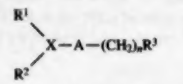
Continuation of Ser. No. 877,170, Jun. 29, 1992, abandoned. This application Jul. 28, 1994, Ser. No. 282,191

Claims priority, application United Kingdom, Jan. 6, 1990, 9000305

Int. Cl.[6] **A61K** *31/445;* **C07D** *405/06;405/12*

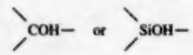
U.S. Cl. 514—321 **7 Claims**

1. A compound of the formula (I):

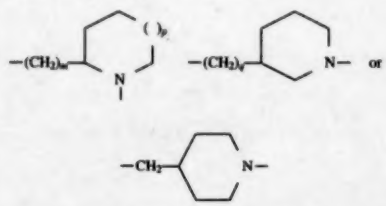


(I)

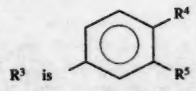
or a pharmaceutically acceptable salt thereof, wherein R^1 and R^2 are the same or different and each is phenyl which is unsubstituted or substituted by at least one group selected from C_1–C_4 alkyl and halo, X is



X being attached to a carbon atom of A, A is



n is from 1 to 3,
m is 1 or 2,
p is 1,
q is 1



wherein R^4 and R^5 are taken together to form a —Y—$(CH_2)_s$—Z— group wherein Y and Z are independently —O— or —CH_2— and s is 1, 2 or 3.

5,486,528

BASIC ETHERS AND PROCESS FOR THE PREPARATION THEREOF

Judit Bajnógel; Gábor Blaskó; Zoltán Budai; Éva Schmidt; András Egyed; Márton Fekete; István Gacsályi; István Gyertyán; Tibor Mezei; Kalára Reiter née Esses; Gyula Simig; Katalin Szemerédi, and Enikő Szirt née Kiszelly, all of Budapest, Hungary, assignors to Egis Gyogyszergyar Rt., Budapest, Hungary

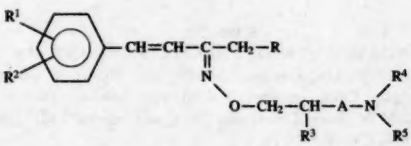
Filed Apr. 11, 1994, Ser. No. 226,089

Claims priority, application Hungary, Apr. 9, 1993, 93 01040

Int. Cl.[6] A61K *31/15;* **C07C** *251/48*

U.S. Cl. 514—331 **8 Claims**

1. A basic ether of the formula (I),



(I)

wherein

R^1 and R^2 are independently hydrogen, halogen or C_{1-4} alkoxy, or together they represent a 3,4-methylenedioxy group,

R stands for C_{1-8} alkyl,

R^3 represents hydrogen, C_{1-4} alkyl or hydroxy,

A is a valency bond or methylene group,

R^4 and R^5 are independently hydrogen, C_{1-12} alkyl or C_{1-12} alkenyl, or

R4 and R^5 form together with the adjacent nitrogen atom 1-pyrrolidinyl, 1-piperidinyl, morpholino or 1-piperazinyl groups, its stereo and optically active isomer or racemic mixture, acid-addition or quaternary ammonium salt thereof.

5,486,529

CERTAIN PYRIDYL KETONES FOR TREATING DISEASES INVOLVING LEUKOCYTE ELASTASE

Peter R. Bernstein, Wallingford; Andrew Shaw, Kennett Square, both of Pa.; Royston M. Thomas, Macclesfield, England; Chris A. Veale, Newark, Del.; Peter Warner, Macclesfield, England, and Donald J. Wolanin, Orange, Conn., assignors to Zeneca Limited, London, England

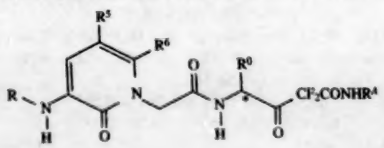
Filed Apr. 8, 1993, Ser. No. 45,496

Claims priority, application United Kingdom, Apr. 16, 1992, 9208385; Aug. 14, 1992, 9217365

Int. Cl.[6] A61K *31/44;* **C07D** *401/12;211/84;213/81*

U.S. Cl. 514—335 **15 Claims**

1. A compound of formula I wherein:



(I)

R^0 is (1–5C)alkyl;

R is hydrogen; or

R is an acyl group of formula A.X.CO— or A.X.CJ— in which A.X—, taken together is trifluoromethyl;

J is oxygen;

X is a direct bond or oxy; and

A is selected from (1–6C)alkyl, aryl or aryl(1–3C)alkyl or pyridyl or pyridyl(1–3C)alkyl wherein an aryl or pyridyl moiety is optionally substituted with a member selected from the group consisting of one halogeno, nitro, methyl or trifluoromethyl group and further wherein the group A is optionally substituted with one substituent selected from a group consisting of hydroxy, lower alkoxy or lower acyloxy; and each of R^5 and R^6 is independently hydrogen or lower alkyl; or one of R^5 and R^6 is hydrogen or methyl and the other of R^5 and R^6 is a radical of formula B.Y— in which B is aryl which aryl independently may bear one substituent defined for A;

Y is a direct bond, methylene, ethylene or trans-vinylene;

R^4 is hydrogen, aryl(1–3C)alkyl, or pyridyl(1–3C)alkyl, wherein an aryl or pyridyl moiety may bear one, halogeno, methyl or trifluoromethyl group and further wherein the group R^4 may bear one substituent selected from a group consisting of hydroxy, lower alkoxy, COORs, CONRtRu, and NRtRu, in which Rs–Ru are independently selected from hydrogen, benzyl or lower(1–6C)alkyl; or for a compound of formula I which is acidic or basic, a pharmaceutically acceptable salt thereof.

5,486,530

USE OF TORASEMIDE FOR THE TREATMENT OF BRAIN OEDEMAS

Tim Boelke; Lothar Kling, both of Mannheim, and Reinhard Koenig, Grunstadt, all of, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Continuation of Ser. No. 133,160, Oct. 21, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,323

Claims priority, application Germany, Apr. 27, 1991, 41 13 820.1

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—347 **8 Claims**

1. A method of treating a brain edema in a patient in need of such treatment, said method comprising administering to said patient an effective amount of 4-3'-methylphenylaminopyridine-3-sulphonamide or a pharmacologically acceptable salt thereof.

5,486,531

HYDROXYMETHYLFURAZANCARBOXYLIC ACID DERIVATIVES

Karl Schönafinger, Alzenau, and Helmut Bohn, Schöneck, both of, Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Germany

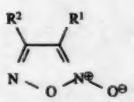
Filed Mar. 7, 1994, Ser. No. 207,280

Claims priority, application Germany, Mar. 6, 1993, 43 07 105.8

Int. Cl.[6] C07D *271/08;* **A61K** *31/41*

U.S. Cl. 514—364 **10 Claims**

1. Hydroxymethylfurazancarboxylic acid derivatives of the formula I



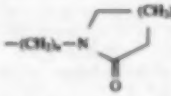
(I)

in which one of the radicals R^1 and R^2 represents hydroxymethyl and the other represents

where

X represents NR^3R^4 or OH or OR^5;

R^3 and R^4, independently of each other, denote hydrogen, (C_1-C_{20})-alkyl, 1-phenyl-(C_2-C_6)-alkyl, 2-phenyl-(C_2-C_6)-alkyl, (C_2-C_6)-alkenyl, (C_3-C_7)-cycloalkyl, $-(CH_2)_n-NR^3R^6$, $-(CH_2)_n-OR^5$, $-(CH_2)_m-COOR^5$, $-CH(Alk)-COOR^5$, $-(CH_2)_m-CONR^3R^6$, $-CH(Alk)-CONR^3R^6$,



$-(CH_2)_n-NR^3(COAlk)$, $-(CH_2)_n-Ar$ or $-(CH_2)_n-Het$, or R^3 and R^4, together with the nitrogen atom linking them, form a heterocycle, which can also be substituted once or more than once by (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, (C_1-C_4)-alkoxy, amino, (C_1-C_4)-alkylamino, di((C_1-C_4)-alkyl)amino, hydroxyl, acetoxy, benzyl, phenethyl or Ar;

R^5 and R^6, independently of each other, denote hydrogen, (C_1-C_6)-alkyl, (C_2-C_6)-alkenyl, (C_3-C_7)-cycloalkyl, benzyl, phenethyl or Ar;

R^7 denotes (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, benzyl or phenyl, or phenyl which is substituted once or more than once by (C_1-C_4)-alkyl, fluorine, chlorine or nitro;

Alk denotes (C_1-C_6)-alkyl;

Ar denotes an aryl radical having 6 to 12 C atoms which can also be substituted once or more than once by (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, amino, (C_1-C_4)-alkylamino, di((C_1-C_4)-alkyl)amino, (C_1-C_4)-alkanoylamino, sulphamoyl, fluorine, chlorine, bromine, hydroxyl, acetoxy, nitro, trifluoromethyl or cyano;

Het denotes a heterocyclic radical having 1 to 3 heteroatoms, which can also be substituted once or more than once by (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, amino, (C_1-C_4)-alkylamino, di((C_1-C_4)-alkyl)amino, (C_1-C_4)-alkanoylamino, fluorine, chlorine, bromine, hydroxyl, acetoxy, nitro, cyano or Ar;

n represents 0, 1, 2, 3 or 4,

m represents 1, 2, 3 or 4,

p represents 1, 2 or 3; and pharmacologically acceptable salts thereof.

5,486,532

BENZOSPIROALKENES

Alex Cordi, Suresnes; Jean-Michel Lacoste, Sevres; Michel Laubie, Vaucresson; Tony Verbeuren, Vernouillet; Jean-Jacques Descombes, Neuilly-Plaisance, and Mark Millan, Paris, all of, France, assignors to Adir et Compagnie, Courbevoie, France

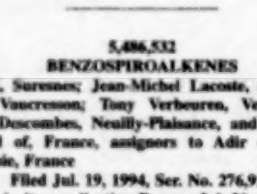
Filed Jul. 19, 1994, Ser. No. 276,910

Claims priority, application France, Jul. 20, 1993, 93 08859

Int. Cl.[6] C07D *26/4/28*

U.S. Cl. 514—374 **9 Claims**

1. A compound of formula (I):



(I)

in which:

X represents $-CH_2-$, $-(CH_2)_2-$, $-CH=CH-$, $-O-CH_2-$, $-S-CH_2-$, $-SO-CH_2-$, or $-SO_2-CH_2-$,

Y represents oxygen,

R_1 represents halogen, linear or branched (C_1–C_6) alkyl which is unsubstituted or substituted with one or more halogen; hydroxyl, or linear or branched (C_1–C_6) alkoxy,

R_2 represents hydrogen or halogen, linear or branched (C_1–C_6) alkyl which is unsubstituted or substituted with one or more halogen; hydroxyl, linear or branched (C_1–C_6) alkoxy, or linear or branched (C_1–C_6) alkylthio,

R_3 represents hydrogen or halogen, linear or branched (C_1–C_6) alkyl which is unsubstituted or substituted with one or more halogen; hydroxyl, linear or branched (C_1–C_6) alkoxy, or linear or branched (C_1–C_6) alkylthio,

R_4 represents hydrogen or amino which is unsubstituted or substituted with one or two linear or branched (C_1–C_6) alkyl;

R_1 and R_2 form, together with the carbon atoms which bear them, a benzenic ring, on condition that, in this case, X represents $-CH_2-$ or $-(CH_2)_2-$,

an optical isomer thereof or an addition salt thereof with a pharmaceutically-acceptable acid, it being understood that by "halogen" is intended fluorine, chlorine, or bromine, and that substituents R_1, R_2, and R_3 cannot include two tertiary butyl substituents on adjacent carbon atoms of the benzene ring.

5,486,533

FUNGICIDAL SUBSTITUTED AZOLE DERIVATIVES

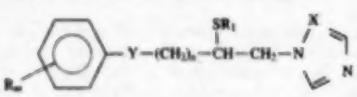
Anupama Mishra, Guelph, Canada, and Robert A. Davis, Cheshire, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn., and Uniroyal Chemical Ltd./Ltee, Elmira, Canada

Division of Ser. No. 263,096, Jun. 21, 1994, which is a continuation of Ser. No. 959,238, Oct. 9, 1992, abandoned. This application May 18, 1995, Ser. No. 443,632

Int. Cl.[6] A01N *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **7 Claims**

1. A compound having the structural formula



I

wherein:

R can be the same or different and is halogen, hydrogen, C_1–C_8 alkyl, C_1–C_8 haloalkyl, C_3–C_6 cycloalkyl, C_7–C_9 aralkyl, phenyl, nitro, C_1–C_6 alkoxy, C_1– C_6 alkylthio, C_1–C_6 alkylsulfinyl, C_1–C_6 alkylsulfonyl, C_7–C_9 aralkoxy, phenoxy, phenylthio, phenylsulfinyl, or phenylsulfonyl;

m is an integer from 0 to 5;

Y is CH_2

n is an integer from 1 to 5;

R_1 is C_{1-C5} alkyl;

X is N; or physiologically acceptable salts thereof.

5,486,534

3,4-SUBSTITUTED PYRAZOLES FOR THE TREATMENT OF INFLAMMATION

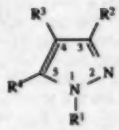
Len F. Lee, St. Charles, Mo.; Thomas D. Penning, Elmhurst, and Steven W. Kramer, Des Plaines, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Jul. 21, 1994, Ser. No. 278,297

Int. Cl.[6] A61K *31/415;* **C07D** *231/12*

U.S. Cl. 514—406 **48 Claims**

1. A compound of Formula I



(I)

wherein R^1 is a radical selected from hydrido, alkyl, alkenyl, alkynyl, haloalkyl, aralkyl, hydroxyalkyl, alkoxyalkyl, cyanoalkyl, aminoalkyl, alklaminoalkyl, carboxyalkyl, alkoxycarbonylalkyl, alkylaminocarbonylalkyl, N-hydroxyaminocarbonylalkyl, N-hydroxy-N-alkyl-aminocarbonylalkyl, arylaminocarboaylalkyl and aminocarbonylalkyl;

wherein R^2 is aryl substituted at a substitutable position with a radical selected from alkylsulfonyl and sulfamyl;

wherein R^3 is selected from aryl, cycloalkyl, and cycloalkenyl; wherein R^3 is optionally substituted at a substitutable position with one or more radicals selected from halo, alkylthio, alkylsulfinyl, alkyl, cyano, carboxyl, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, arylaminocarbonyl, N-alkyl-N-arylaminocarbonyl, haloalkyl, hydroxyl, alkoxy, hydroxyalkyl, haloalkoxy, amino, alkylamino, arylamino, heterocyclo and nitro; and

wherein R^4 is selected from hydrido, alkyl, haloalkyl, carboxyalkyl, alkoxycarbonylalkyl, aralkoxycarbonylalkyl, aminocarbonylalkyl, hydroxyalkyl and aralkoxyalkyl;

or a pharmaceutically-acceptable salt thereof.

5,486,535

METHOD FOR TREATING TOXOPLASMOSIS

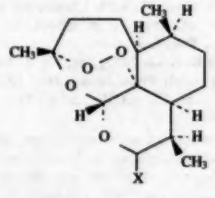
J. Joseph Marr, Lake Forest, Ill.; Edward C. Krug, Aurora; Randolph L. Berens, Littleton, both of Colo., and Ou-Yang Ke, Hunan, China, assignors to Regents of the University of Colorado, Boulder, Colo.

Continuation-in-part of Ser. No. 858,226, Mar. 26, 1992, abandoned, which is a continuation of Ser. No. 543,978, Jun. 26, 1990, abandoned. This application Sep. 7, 1993, Ser. No. 117,414

Int. Cl.[6] A61K *31/335*

U.S. Cl. 514—450 **12 Claims**

1. A method for treating toxoplasmosis in a mammal comprising the step of administering to said mammal a therapeutically effective amount of the compound



where X is OR, where R is a straight chain or branched alkyl having 1–6 carbons, whereby the growth of the organism causing toxoplasmosis is inhibited.

5,486,536

SULFATIDES AS ANTI-INFLAMMATORY COMPOUNDS

Peter A. Ward, Ann Arbor, Mich.; Masayuka Miyasaka, Suita, and Yasuo Suzuki, Shizuoka, both of, Japan, assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Aug. 15, 1994, Ser. No. 289,585

Int. Cl.[6] A61K *31/35*

U.S. Cl. 514—460 **12 Claims**

1. A method of treating selectin-dependent lung inflammation in a patient in need thereof comprising,

administrating an effective amount of a sulfatide.

5,486,537

TOPICAL ANTI-FUNGAL COMPOSITION FOR SKIN AND KERATINOUS TISSUE

Reynaldo G. Farinas, Miami, Fla., assignor to Dayton Laboratories, Inc., Miami, Fla.

Filed Jan. 20, 1995, Ser. No. 375,705

Int. Cl.[6] A61K *31/335;31/34;31/11;31/045*

U.S. Cl. 514—462 **29 Claims**

1. In combination, an anti-fungal composition effective against *Trichophyton mentagrophytes* and *Candida albicans*, and a closed container, wherein said composition is disposed within said closed container, said composition comprising a solution of cinnamic aldehyde, up to about 20% by weight griseofulvin, and at least 5% by volume an alcohol selected from the group consisting of isopropanol and ethanol.

5,486,538

PRECIOUS METAL HUMATES AND THEIR PREPARATIONS

Bernhard Seubert, Edingen-Neckarhausen, and Anton F. Haase, Muhltal, both of, Germany, assignors to Rutgerswerke Aktiengesellschaft, Germany

Filed Aug. 29, 1994, Ser. No. 298,419

Claims priority, application Germany, Jan. 16, 1993, 43 35 370.3

Int. Cl.[6] A61K *31/28;* **C07F** *1/12;15/00*

U.S. Cl. 514—492 **5 Claims**

1. A process for the preparation of a stable precious metal humate comprising electrochemically oxidizing an aqueous alkaline solution of a polyvalent phenolic compound in an anode chamber, adding to the said solution after the start of the oxidation reaction an aqueous solution or hydrosol of the precious metal salt, completing the electrochemical oxidation and adjusting the pH to 4 to 6 to obtain the precious metal humate.

2. A process for the preparation of a stable precious metal humate comprising plasmachemically oxidizing an aqueous alkaline solution of a polyvalent phenolic compound in the reaction tube, adding to the solution after the start of the oxidation reaction an aqueous solution or hydrosol of the precious metal salt, completing the oxidation reaction and adjusting the pH to 4 to 6 to obtain the precious metal humate.

3. A precious metal salt of a humic acid with a mean molecular weight of 900 to 30,000 Daltons containing 1 to 5% by weight of the precious metal.

5,486,539

METHOD OF USING PHENYLACETONITRILEALKYLAMINOALKYL-ORTHO-SUBSTITUTED ARYL COMPOUNDS AS IMMUNOSUPPRESSIVES

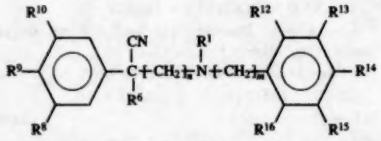
Chi-Dean Liang, Glenview, Ill.; John P. McKearn, Pacific; John M. Farah, Jr., St. Louis, both of Mo., and Richard A. Mueller, Glencoe, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 926,732, Aug. 6, 1992, abandoned, which is a continuation of Ser. No. 623,596, Dec. 12, 1990, Pat. No. 5,162,569, which is a continuation-in-part of Ser. No. 609,145, Nov. 6, 1990, abandoned, which is a continuation of Ser. No. 456,004, Dec. 21, 1989, abandoned. This application Mar. 1, 1994, Ser. No. 204,121

Int. Cl.[5] A61K *31/275*

U.S. Cl. 514—521 **3 Claims**

1. A method to suppress immune response in a subject, said method comprising administering to said subject a therapeutically-effective amount of an immunosuppressive compound of Formula I:



(II)

wherein m is one or two; wherein n is a number selected from one to five, inclusive; wherein R^1 is selected from hydrido, alkyl, hydroxyalkyl, cycloalkyl, cycloalkylalkyl, alkoxyalkyl, alkenyl and alkynyl; wherein R^6 is selected from loweralkyl; wherein each of R^8, R^9, R^{10} and R^{12} through R^{16} is independently selected from hydrido, hydroxy, alkoxy, alkenyl, alkynyl, alkylcarbonyl, alkoxycarbonyl and alkoxyalkyl; with the proviso that at least one of R^{12} and R^{16} must be selected from alkoxycarbonyl; or a tautomer thereof or a pharmaceutically-acceptable salt thereof.

5,486,540

CYCLOPENTANE HEPTANOIC OR HEPTENOIC ACID, 2-ARYLALKYL OR ARYLALKENYL AND DERIVATIVES AS THERAPEUTIC AGENTS

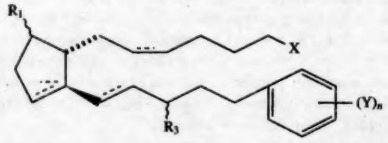
Steven W. Andrews, Irvine, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Oct. 28, 1993, Ser. No. 144,968

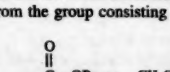
Int. Cl.[6] A61K *31/215;31/19;31/045*

U.S. Cl. 514—530 **10 Claims**

1. A method of treating ocular hypertension which comprises applying to the eye an amount sufficient to treat ocular hypertension of a compound of formula (I)



wherein the solid triangle indicates (β) configuration; the hatched line indicates α configuration; the wavy line indicates either an α or β configuration; the dashed bonds represent a single bond or a double bond which can be in the cis or trans configuration; X is a radical selected from the group consisting of



wherein R_4 is hydrogen or is a lower alkyl radical having up to 6 carbon atoms; Y is a radical selected from the group consisting of halo, nitro, amino, thiol, hydroxy, alkyloxy and alkylcarboxy; R_1 is —OH, or a —O(CO)R_6 group and R_3 is —OH or an —O(CO)R_6 group, wherein R_6 is a saturated or unsaturated acyclic hydrocarbon group having from 1 to about 20 carbon atoms, or —$(CH_2)_m R_7$ wherein m is 0–10, and R_7 is an aliphatic ring having from about 3 to about 7 carbon atoms, or an aromatic ring; or a pharmaceutically acceptable salt thereof.

5,486,541

MONOFLUORINATED DERIVATIVES OF N-PROPARGYL-1-AMINOINDAN AND THEIR USE AS INHIBITORS OF MONOAMINE OXIDASE

Jeff Sterling, Jerusalem; Ruth Levy, Tel-Aviv; Alex Veinberg, Rehovot; Willy Goldenberg, Jerusalem; John Finberg, Tivon; Musa Youdim, and Arieh Gutman, both of Haifa, all of, Israel, assignors to Teva Pharmaceutical Industries, Ltd., Jerusalem, Israel

Continuation of Ser. No. 961,132, Oct. 14, 1992, abandoned. This application Sep. 22, 1994, Ser. No. 310,480

Claims priority, application Israel, Jan. 16, 1991, 99759

Int. Cl.[6] A61K *31/135;* **C07C** *211/42*

U.S. Cl. 514—657 **18 Claims**

1. A compound selected from the group consisting of 4-fluoro-N-propargyl- 1-aminoindan, 5-fluoro-N-propargyl-1-aminoindan, 6-fluoro-N-propargyl-1-aminoindan and pharmaceutically acceptable addition salts thereof.

5,486,542

PROCESS FOR THE DISTILLATION OF FISHER-TROPSCH PRODUCTS

Sytze A. Posthuma; Hermanus M. H. Wechem, and Hendrikus Heetveld, all of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 188,495, Jan. 28, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 486,157

Int. Cl.[6] C07C *27/00*

U.S. Cl. 518—700 **9 Claims**

1. A process for the distillation of a hydrocarbon mixture, which mixture has been prepared by a Fischer-Tropsch synthesis, which process comprises supplying the hydrocarbon mixture to a wiped film evaporator and recovering a first fraction having a low boiling point range and a narrow melting point range as the light product from the evaporator and recovering a second fraction having a high boiling point range and a wider melting point range as the heavy product of the evaporator.

5,486,543

FORMED THERMOPLASTIC RESIN ARTICLE AND PRODUCTION PROCESS THEREOF

Tsunetoshi Shinada; Katsuo Wada, both of Yokohama; Haruo Inoue, Zushi; Masaki Misumi, Chigasaki, and Akira Saito, Yokohama, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 22, 1993, Ser. No. 171,443

Claims priority, application Japan, Dec. 28, 1992, 4-348205

Int. Cl.[6] C08F *2/60;16/00*

U.S. Cl. 521—149 **9 Claims**

1. A formed thermoplastic resin article comprising thermoplastic resin and foamed elastic polymer finely dispersed therein, wherein said formed thermoplastic resin article is obtained by blending an elastic polymer containing an endothermic foaming agent decomposable at a temperature of at least 160° C., said endothermic foaming agent being mixed with the elastic polymer at a temperature lower than the decomposition temperature of the endothermic foaming agent, in a thermoplastic resin and then

plasticizing and forming the resultant resin blend at a temperature at least equal to the decomposition temperature of the endothermic foaming agent.

5,486,544

POLYMERIZABLE COMPOSITION

Mitsunobu Kawashima, and Ikuo Omura, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 895,170, Jun. 8, 1992, abandoned, which is a continuation of Ser. No. 550,508, Jul. 10, 1990, abandoned. This application Sep. 12, 1994, Ser. No. 304,434

Claims priority, application Japan, Jul. 12, 1989, 1-181382

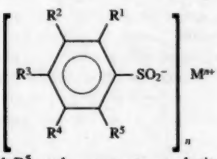
Int. Cl.[6] C08F *2/46*

U.S. Cl. 522—17 **20 Claims**

1. A polymerizable composition, comprising:

(a) a monomer;

(b) a sulfinate having the formula (I):



(I)

wherein R^1 and R^5 each represents a substituent having 2 to 6 carbon atoms, R^2, R^3 and R^4 each represents an atom or substituent inert to said monomer (a), M^{n+} represents an n-valent cation, and n represents an integer of 1 to 2, and wherein said monomer has a carbon-carbon double bond directly linked to an electron attracting group.

5,486,545

PROCESS FOR MAKING PROPENYL ETHERS AND PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING THEM

James V. Crivello, Clifton Park, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Division of Ser. No. 988,214, Dec. 9, 1992, abandoned. This application Apr. 25, 1994, Ser. No. 232,507

Int. Cl.[6] C08F *2/46*

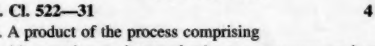
U.S. Cl. 522—31 **4 Claims**

1. A product of the process comprising

(a) preparing a mixture of at least one monomer selected from the group consisting of

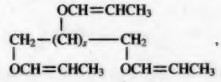
(i) neopentylglycol dipropenyl ether;

(ii) compounds of the formula



(I); and

(iii) compounds of the formula



(II)

wherein p is an integer from 2 to 20; and s is 0 or an integer from 1 to 4; and from 0.01 to 20% by weight of a cationic photoinitiator chosen from the group consisting of diaryliodonium, triarylsulfonium, diaryliodosonium, triarylsulfoxonium, dialkylphenacyl sulfonium, and dialkylhydroxyphenyl sulfonium salts; and

(b) exposing said mixture to ultraviolet light for a period of time sufficient to produce a solid polymer which is infusible and insoluble in common solvents.

5,486,546

METHOD OF PRODUCING A MICROSTRUCTURE IN A BIORESORBABLE ELEMENT

Torbjorn Mathiesen, Bandhagsplan 9, S-13224 Bandhagen; Gunnar Bernhard, Mastvagen 12, 181 43 Lidingo, both of, Sweden, and Phil Rumsby, Longhamborough, England

PCT No. PCT/SE92/00404, § 371 Date Feb. 7, 1994, § 102(e) Date Feb. 7, 1994, PCT Pub. No. WO92/22336, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 10, 1992, Ser. No. 162,053

Claims priority, application Sweden, Jun. 10, 1991, 9101752

Int. Cl.[6] C08G *63/02*

U.S. Cl. 522—165 **7 Claims**

1. A method of producing a microstructure in at least a portion of a bioresorbable aliphatic polymer material adapted to be employed in a living body, which process comprises exposing said material to energy from an excimer laser operated at a maximum wave length of 248 mm, wherein a major portion of said material comprises at least one aliphatic polyester or aliphatic polycarbonate polymer, or blends thereof, made from one or more monomers selected from the class consisting essentially of glycolic acid, glycolide, lactic acid, lactide, ϵ-caprolactone, trimethylene carbonate, paradioxanone, 1,5-dioxepan-2-one, valerolactone and β-bμyrolactone, and mixtures thereof.

5,486,547

SURGICAL ADHESIVE SHEET, SURGICAL INSTRUMENTS AND METHODS OF USING THE SAME

Takehisa Matsuda, Minoo; Tetsuo Itoh, Shiga, and Tohru Tani, Kusatsu, all of, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Division of Ser. No. 127,477, Sep. 28, 1993, which is a continuation of Ser. No. 497,985, Mar. 23, 1990, abandoned. This application Nov. 3, 1994, Ser. No. 335,341

Claims priority, application Japan, Mar. 23, 1989, 1-71407; Mar. 23, 1989, 1-71408; Mar. 23, 1989, 1-71409

Int. Cl.[6] A61L *15/26;* **C08L** *75/04;75/08*

U.S. Cl. 523—111 **13 Claims**

1. A surgical adhesive sheet, comprising

a sheet material comprising at least one polymer selected from the group consisting of polyurethane resins, silicone resins and fluorine-containing resins, coated with

a surgical adhesive comprising an NCO-terminated urethane prepolymer having a free isocyanate group content of 2–10% by weight, wherein said sheet is anhydrous or contains water in an amount insufficient to crosslink the prepolymer.

5,486,548

ACRYLATES AND METHACRYLATES BASED ON CYCLOHEXYLDIPHENOLS

Wolfgang Podszun, Köln, Germany, and Michael Müller, Mortsel, Belgium, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

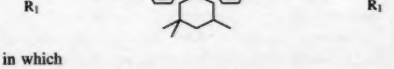
Filed Jul. 14, 1994, Ser. No. 275,211

Claims priority, application Germany, Jul. 21, 1993, 43 24 431.9

Int. Cl.[6] C08F *20/30;20/20;* **A61C** *13/087;* **A61K** *6/083*

U.S. Cl. 523—115 **4 Claims**

1. Dental articles comprising polymers obtained from monomers of the formula (IIIb)



(IIIb)

in which

R_1 represents hydrogen or methyl,

L represents a C_2- to C_6-alkylene radical which can be substituted by alkyl, hydroxyl or halogen, and

n and m independently of one another denote an integer from 1 to 4.

5,486,549

LOW-FOAMING WATER-BASED PRINTING INK COMPOSITION

Akinari Itagaki; Syuuichi Azechi; Satoshi Kuwata, all of Gunma; Yousuke Tsutsumi, and Masanori Kodaiku, both of Osaka, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, and Sakata Inx Corp., Osaka, both of, Japan

Filed Oct. 25, 1994, Ser. No. 328,648

Claims priority, application Japan, Jan. 26, 1993, 5-267202

Int. Cl.[6] C09D *5/00;* **C08K** *3/36*

U.S. Cl. 523—161 **10 Claims**

1. A low-foaming water-based printing ink composition which comprises, as a uniform blend:

(A) an organic polymer in the form of an aqueous solution or in the form of an aqueous emulsion;

(B) a coloring agent; and

(C) a silicone-based defoaming composition, in an amount in the range from 0.01 to 10% by weight, comprising:

(a) 100 parts by weight of a polyoxyalkylene group-containing organopolysiloxane represented by the average unit formula

$$G_aR^1_bSiO_{(4-a-b)/2},$$

in which R^1 is a monovalent hydrocarbon group having 1 to 18 carbon atoms, G is a polyoxyalkylene group represented by the general formula

$$—R^2—O—(—R^3—O—)_p—Q,$$

R^2 being a divalent hydrocarbon group having 1 to 10 carbon atoms, R^3 being an ethylene group $—C_2H_4—$ or a propylene group $—C_3H_6—$, Q being an atom or group selected from the class consisting of a hydrogen atom, alkyl groups having 1 to 8 carbon atoms, acetyl group and isocyanato group —NCO and the subscript p being a positive integer not exceeding 200, the subscript a is a positive number in the range from 0.005 to 0.5 and the subscript b is a positive number in the range from 1.4 to 2.195 with the proviso that a +b is in the range from 1.9 to 2.2;

(b) from 2 to 200 parts by weight of a polydimethylsiloxane having a viscosity in the range from 100 to 1,000,000 centistokes at 25° C.;

(c) from 0.1 to 40 parts by weight of a finely divided silica powder having a specific surface area of at least 50 m^2/g; and

(d) from 0.05 to 60 parts by weight of an organopolysiloxane resin soluble in an organic solvent which consists of the siloxane units of the unit formula $R^4_3SiO_{0.5}$, siloxane units of the unit formula SiO_2, siloxane units of the unit formula R^4_2SiO and siloxane units of the unit formula $R^4SiO_{1.5}$, R^4 in the unit formulas being a monovalent hydrocarbon group having 1 to 6 carbon atoms, of which the combined molar fraction of the siloxane units of the formula $R^4_3SiO_{0.5}$ and the siloxane units of the formula SiO_2 is at least 80% and the molar ratio of the siloxane units of the formula $R^4_3SiO_{0.5}$ to the siloxane units of the formula SiO_2 is in the range from 0.5 to 1.5.

5,486,550

WATER BASED PIGMENTED INK

Manfred Lubas, Nürnberg, Germany, assignor to J.S. Staedtler GmbH & Co., Nurnberg, Germany

Filed Jun. 17, 1994, Ser. No. 261,638

Claims priority, application Germany, Jun. 24, 1993, 43 20 959.9

Int. Cl.[6] C09D *11/10*

U.S. Cl. 523—161 **15 Claims**

1. An ink for writing, drawing, painting, printing or marking, the ink comprising a mixture of coloring matter comprising color pigments formed of at least one dye and at least one solid polymer dispersion component, wherein the at least one dye is selected from the group consisting of Basic Yellow 40, Solvent Yellow 43, Basic Red 1, Basic Red 1:1, Basic Violet 10, Basic Blue 3, Reactive Blue 41, Solvent Yellow 160/1, Basic Violet 11:1, Basic Violet 35, or from a mixture thereof, and wherein the at least one solid polymer dispersion component comprises 60–65% acrylonitrile and 35–40% by weight of butyl acrylate, further comprising a stabilizing acid group-free polyhydroxy compound selected from the group consisting of a sugar, a sugar alcohol, a polyglycerin or a mixture thereof, at least one of a surfactant and an emulsifier, at least one preservative, and water as solvent, wherein the color pigments are reaction products formed within the ink mixture through a reaction between functional groups of the at least one alkaline dye and the at least one solid polymer dispersion component.

5,486,551

METHOD FOR PREPARING A FINELY DIVIDED, FREE FLOWING ORGANOSILOXANE ELASTOMER BASE EXHIBITING REDUCED COMPRESSION SET FOLLOWING CURING

Keith E. Polmanteer, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 3, 1995, Ser. No. 368,065

Int. Cl.[6] C08K *9/06*

U.S. Cl. 523—212 **4 Claims**

1. A method for reducing the compression set of a cured elastomer prepared from a curable organosiloxane elastomer base in the form of a free flowing powder said method comprising the following sequential steps:

1) maintaining in the fluidized state a finely divided form of a previously prepared non-creping organosiloxane elastomer base comprising a curable polyorganosiloxane gum and reinforcing silica filler having silanol groups on the surface thereof, wherein a portion of said silanol groups sufficient to reduce creping have been converted to organosiloxy groups;

2) blending said base with an organosilicon compound of the general formula R^1_3SiX or $(R^1_3Si)_2NR^2$ under conditions sufficient to react said compound with at least a portion of the residual silanol groups in said base, wherein the molar ratio of said organosilicon compound to the combined concentration of silanol and silicon-bonded hydrolyzable groups present in said base is at least 0.5:1, and

3) isolating the resultant organosiloxane composition as a free flowing powder;

wherein each R^1 is individually selected from monovalent hydrocarbon radicals free of ethylenic unsaturation, X represents a hydrolyzable group, R^2 is selected from the group consisting of hydrogen and R^1.

5,486,552

Patent Not Issued For This Number

5,486,553
ADVANCED POLYMER/WOOD COMPOSITE STRUCTURAL MEMBER

Michael J. Deaner, Osceola, Wis.; Giuseppe Puppin, Bayport, and Kurt E. Heikkila, Circle Pines, both of Minn., assignors to Andersen Corporation, Bayport, Minn.

Continuation of Ser. No. 938,365, Aug. 31, 1992, abandoned. This application Apr. 7, 1994, Ser. No. 224,399

Int. Cl.[6] C08L *97/00;* **C08K** *11/00;* **E04C** *1/00;* **B32B** *21/00*

U.S. Cl. 524—13 **22 Claims**

1. A polymer wood thermoplastic composite structural member, suitable for use as a replacement for a wood structural member, which thermoplastic composite structural member comprises a composite member with a Youngs modulus of greater than 500,000, and a coefficient of thermal expansion less than 3×10^{-5} in/in-°F. and which composite member comprises a continuous organic phase comprising about 35 to 65 wt-% of a polymer comprising vinyl chloride and, dispersed in the continuous phase, about 35 to 55 wt-% of wood fiber having an aspect ratio of at least about 2.

5,486,554
METHOD AND APPARATUS FOR TREATMENT OF ASPHALT AND SYNTHETIC RESINS

Daniel A. Truax, Kansas City, Mo., assignor to Ultra-Technologies, Inc., Kansas City, Mo.

Continuation of Ser. No. 41,289, Mar. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 891,408, May 29, 1992, abandoned. This application May 17, 1994, Ser. No. 245,066

Int. Cl.[6] C08L *95/00;* **C08F** *6/00*

U.S. Cl. 524—71 **20 Claims**

1. A method of preparing an asphalt and/or synthetic resin composition comprising the steps of:

forming a mixture including at least one of: (1) asphalt and reclaimed rubber particles; (2) asphalt and synthetic resin having a melting point of about 700° F. or less; and (3) synthetic resin having a melting point of 700° F. or less;

directing said mixture into a confined reaction zone simultaneously with a quantity of a stream of water and/or steam, and subjecting the mixture in said confined reaction zone to conditions of elevated temperature and shear, and to a pressure of from about 100–800 psi, to agitate and foam the mixture and render it flowable;

passing said agitated mixture from said confined reaction zone into a reaction vessel under pressure conditions above atmospheric but below the pressure of said confined reaction zone, and retaining the agitated mixture within said reaction vessel for a time sufficient to assure substantial homogeneity of the mixture; and

recovering said homogeneous mixture,

said rubber particles having a maximum average size which will pass through an 8-mesh screen.

5,486,555
PROCESS FOR PRODUCTION OF STABILIZED POLYCARBONATE

Masumi Hirata; Wataru Funakoshi, and Katsushi Sasaki, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 294,995, Aug. 24, 1994. This application May 10, 1995, Ser. No. 437,980

Claims priority, application Japan, Aug. 26, 1993, 5-211367; Jan. 29, 1993, 5-272263; Dec. 16, 1993, 5-316646

Int. Cl.[6] C08K *5/46;5/42*

U.S. Cl. 524—83 **10 Claims**

1. A process for the production of a stabilized polycarbonate which comprises melt-polycondensing an aromatic dihydroxy compound and a carbonic acid diester in the presence of a polycondensatlon catalyst and then, after the reaction mixture shows an intrinsic viscosity of at least 0.1, adding at least one stabilizer selected from the group consisting of a compound of the formula (IV)

$$A^5\text{-}Ad^1\text{-}A^4\text{-}(Ad^2\text{-}A^5)_l \qquad \text{(IV)}$$

wherein A^5 is a monovalent or divalent hydrocarbon group,

A^4 is a divalent hydrocarbon group,

each of Ad^1 and Ad^2 is independently an acid anhydride group selected from the group consisting of $-SO_2\text{-}O\text{-}SO_2-$, $-SO_2\text{-}O\text{-}CO-$ and $-CO\text{-}O\text{-}SO_2-$, and l is 0 or 1,

provided that when l is 0, $-(Ad^2\text{-}A^5)_l$ is a hydrogen atom or a bond between A^4 and A^5, in which A^5 is a divalent hydrocarbon group or a single bond,

in an amount of 0.01 to 500 ppm of a polycarbonate to be formed, to form a polycarbonate having a desired intrinsic viscosity.

5,486,556
POLYMER COMPOSITION CONTAINING A PIPERIDYL-TRIAZINE COMPOUND

Toshimasa Toda; Satoru Naito; Hisayu Osawa, and Takaaki Yamazaki, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

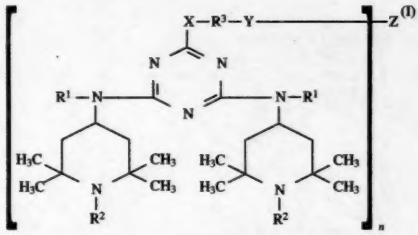
Division of Ser. No. 474,292, Feb. 2, 1990, Pat. No. 5,446,144, which is a continuation of Ser. No. 257,753, Oct. 14, 1988, abandoned. This application May 2, 1995, Ser. No. 432,665

Claims priority, application Japan, Jan. 30, 1987, 62-273138

Int. Cl.[6] C08K *5/3492*

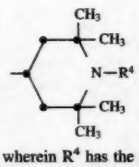
U.S. Cl. 524—100 **10 Claims**

1. A polymer composition comprising a polymer stabilized against the effects of light and heat by the incorporation of a polymer stabilizer, wherein the polymer stabilizer comprises at least one compound selected from the group consisting of compounds of formula (I):



wherein:

R represents a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, an alkoxyalkyl group having from 3 to 22 carbon atoms, a carboxylic acyl group having from 2 to 18 carbon atoms, a phenylalkyl group in which the alkyl part has from 1 to 4 carbon atoms and in which the phenyl part is unsubstituted or has at least one substituent selected from the group consisting of C_1–C_4 alkyl groups, C_1–C_4 alkoxy groups and halogen atoms, or a group of formula (II):



(II)

wherein R^4 has the same meaning as defined below for [2];

R^2 represents a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, a carboxylic acyl group having from 2 to 18 carbon atoms or a phenylalkyl group in which the alkyl part has from 1 to 4 carbon atoms and in which the phenyl part is unsubstituted or has at least one substituent selected from the group consisting of C_1–C_4 alkyl groups, C_1–C_4 alkoxy groups and halogen atoms;

R^3 represents an alkylene group having from 1 to 6 carbon atoms or an alkylene group having from 1 to 6 carbon atoms which is interrupted by at least one oxygen atom;

X represents an oxygen atom or a group of formula —NR^5—, wherein R^5 represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;

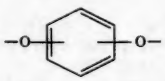
Y represents a group of formula —OCO—, a group of formula —COO—, a group of formula —CONH— or a group of formula —OCONH—;

is an integer from 2 to 4; and

when n is 2:

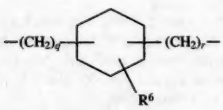
Z represents:

(i) an alkylene group having from 1 to 18 carbon atoms or an alkylene group having from 1 to 18 carbon atoms which is interrupted by at least one member selected from the group consisting of oxygen atoms, sulfur atoms and groups of formula (II'):



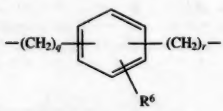
(II')

or (ii) a group of formula (III):



(III)

or (iii) a group of formula (IV):

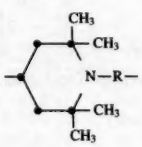


(IV)

or (iv) a group of formula (V):

(V)

or (v) a group of formula (VI):



(VI)

wherein:

R^6 represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;

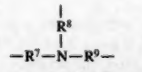
R represents an alkylene group having from 2 to 4 carbon atoms;

p is an integer from 1 to 4; and

q and r are independently selected from the group consisting of the cipher 0 and the integers from 1 to 3;

when n is 3:

Z represents an alkanetriyl group having from 3 to 8 carbon atoms or a group of formula (VII):



(VII)

wherein R^7, R^8 and R^9 are independently selected from the group consisting of alkylene groups having from 1 to 5 carbon atoms, provided that the total number of carbon atoms in $R^7+R^8+R^9$ is from 3 to 8;

or when n is 4:

Z represents an alkanetetrayl group having from 4 to 8 carbon atoms or an alkanetetrayl group having from 4 to carbon atoms which is interrupted by at least one oxygen atom;

and acid addition salts thereof.

5,486,557

FURFURYL ALCOHOL-FORMALDEHYDE RESINS

Denis W. Akerberg, Lafayette, Ind., assignor to QO Chemicals, Inc., West Lafayette, Ind.

Filed Aug. 16, 1994, Ser. No. 291,170

Int. Cl.[6] C08K *5/15;5/353;5/54*

U.S. Cl. 524—111 **6 Claims**

1. A composition for use as a binder for composite materials comprising:

a water-compatible furfuryl alcohol-formaldehyde resins said resin comprising the reaction product of furfuryl alcohol with formaldehyde in a molar ratio of at least 1:2, said resin containing not more than 10% by weight of water insoluble material; and

from about 0.15 to 0.30% by weight of gamma-aminopropyltrimethoxysilane based on the weight of the resin.

5,486,558

PLASTIC CLOSURES AND CLOSURE LINERS

Robert W. Lee, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 80,338, Jun. 21, 1993, abandoned. This application Oct. 24, 1994, Ser. No. 328,334

Int. Cl.[6] C08L *33/00*

U.S. Cl. 524—241 **5 Claims**

1. A closure liner comprising a blend consisting essentially of poly (1-butene), random polypropylene copolymer, ethylene methyl acrylate and an effective amount of lubricating agent;

wherein said poly (1-butene) is present in an amount of about 20–85% wt, said ethylene methyl acrylate is present in an amount of about 20–80% wt, said polypropylene is present in an amount of about 20–80% wt, and said lubricating agent is present in an amount of about 0.5–5% wt;

wherein said poly (1-butene) is semicrystalline having from about 35% to about 60% crystallinity, and wherein the crystallization temperature of said poly (1-butene) is from about 30° C. to about 90° C. as measured by a differential scanning calorimeter.

5,486,559

OPTICALLY NON-LINEAR ACTIVE WAVEGUIDING MATERIAL COMPRISING DONOR AND ACCEPTOR GROUPS-CONTAINING TRIPHENYLCARBINOLS

Johannes F. J. Engbersen, Ede; Erik Kelderman, Enschede; David N. Reinhoudt, Henegelo, and Willem Verboom, Vriezenveen, all of, Netherlands, assignors to Akzo Nobel NV, Arnhem, Netherlands

Filed Aug. 11, 1994, Ser. No. 289,044

Claims priority, application European Pat. Off., Aug. 19, 1993, 93202453

Int. Cl.[6] C08K *5/13;5/05;* **G02B** *6/00*

U.S. Cl. 524—299 **5 Claims**

1. An optically non-linear active waveguiding material comprising an optically transparent polymer and an optically non-linear active dopant comprising a donor-π-acceptor unit, characterised in that the optically non-linear active dopant is a donor and acceptor groups-containing triphenylcarbinol.

5,486,560
VARIABLE-MODULUS MATERIAL

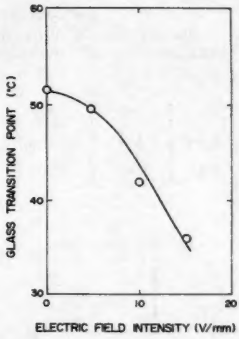
Tohru Shiga; Yoshiharu Hirose; Akane Okada, and Toshio Kurauchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Division of Ser. No. 170,858, Dec. 21, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 320,524

Claims priority, application Japan, Dec. 25, 1992, 4-345875

Int. Cl.[6] C08K *3/00;3/10;* **H01B** *1/00*

U.S. Cl. 524—401 **14 Claims**



1. A method for dampening vibrations, comprising the step of applying an electric field in a manner responsive to vibrations to a variable-modulus polymer material, wherein said electric field has a strength of 5 to 150 V/mm,

wherein said variable-modulus polymer material decreases in modulus upon application of an electric field.

5,486,561
POLYPROPYLENE RESIN COMPOSITION

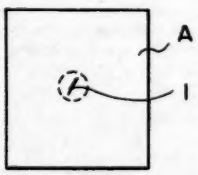
Koki Hirano; Ryuichi Ohki, and Yutaka Kobayashi, all of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1993, Ser. No. 49,302

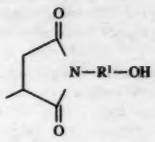
Claims priority, application Japan, Apr. 21, 1992, 4-100773

Int. Cl.[6] C08J *3/00;* **C08K** *5/09;* **C08L** *37/00;* **C08F** *8/00*

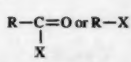
U.S. Cl. 524—451 **6 Claims**



1. A polypropylene resin composition consisting essentially of 50 to 90% by weight of (a) polypropylene; 50 to 10% by weight of (b) an ethylene/αolefin copolymer elastomer having a Mooney viscosity of 10 to 100 (ML 1+4 (100° C.)); 0.1 to 15 parts by weight based on 100 parts by weight of the components (a) and (b) in total of (c) a modified polyolefin formed by introducing a functional group in either or both end of a straight-chain polyolefin having a number-average molecular weight of 1,000 to 10,000, wherein the group is one selected from a hydroxyl group, a maleic anhydride group, an unsaturated carboxylic group and a polar group represented by the general formula

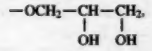


wherein R^1 is an alkylene group having 1 to 4 carbon atoms; and 0.1 to 1.0 part by weight based on 100 parts by weight of the components (a) and (b) in total of (d) a compound represented by the general formula (I)



(I)

wherein R is a straight chain alkyl group having 10 to 22 carbon atoms and X denotes $—N(CH_2CH_2OH)_2$ or



wherein the straight-chain polyolefin has a number average molecular weight of 2,000 to 6,000; and wherein component (d) is selected from the group consisting of stearic acid monoglyceride, stearyl diethanolamine, N-diethanol stearylamide and N-diethanol dodecaneamide.

5,486,562
MODIFICATIONS OF POLY(ALKYLENE CYCLOHEXANEDICARBOXYLATE) BLENDS

Willem F. H. Borman, Evansville, and Nan-I Liu, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 957,459, Oct. 6, 1992, abandoned, which is a continuation of Ser. No. 551,397, Jul. 12, 1990, abandoned. This application Aug. 2, 1994, Ser. No. 284,725

Int. Cl.[6] C08L *69/02*

U.S. Cl. 524—451 **20 Claims**

1. A composition comprising:

(A) from 75 to 95 parts by weight of a polyester resin comprising the reaction product

(a) at least one straight chain, branched, or cycloaliphatic C_2–C_{10} alkane diol or chemical equivalent thereof; and

(b) at least one cycloaliphatic diacid or chemical equivalent thereof; and

(B) from 5 to about 25 parts by weight of a substantially amorphous resin comprising a terpolymer of acrylonitrile, at least 62 percent by weight butadiene, and styrene, wherein the styrene to acrylonitrile ratio is from about 3.5:1 to about 2.5:1 and the butadiene to styrene/acrylonitrile ratio is 7:3, the sum of (A) and (B) being 100 parts by weight.

5,486,563
PROCESS FOR MAKING DISPERSANT VISCOSITY INDEX IMPROVERS

Robert J. Sutherland, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 20, 1994, Ser. No. 359,806

Int. Cl.[6] C08L *51/00*

U.S. Cl. 524—534 **11 Claims**

1. A process for making a dispersant viscosity index improver, comprising the sequential steps of:

dissolving a star polymer in a lubricating oil at a polymer concentration of from 3% to 30% by weight, the star polymer comprising:

at least 3 first arms comprising a preponderance of a hydrogenated, polymerized conjugated alkadiene, the first arms having a peak molecular weight from 10,000 to 200,000;

at least 3 second arms comprising a preponderance of a polymerized methacrylate, the second arms having a peak molecular weight from 500 to 10,000; and

a central core comprising a polymerized bisunsaturated monomer, wherein the central core connects the first and second arms in a star configuration;

reacting the dissolved star polymer with an acid catalyst; and

reacting the dissolved star polymer with an amine.

5,486,564

HIGH PURITY POLYHYDROGEN SILSESQUIOXANE RESIN FOR ELECTRONIC COATINGS

Katsutoshi Mine; Takashi Nakamura, and Motoshi Sasaki, all of Chiba, Japan, assignors to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Division of Ser. No. 145,923, Oct. 29, 1993, Pat. No. 5,416,190. This application Feb. 13, 1995, Ser. No. 387,697

Claims priority, application Japan, Nov. 24, 1992, 4-338103

Int. Cl.[6] C08L *83/00*

U.S. Cl. 524—588 **8 Claims**

1. A high purity electronic coating composition comprising polyhydrogen silsesquioxane resin having a sodium content of 9 ppb or less, a sulfur content of 14 ppm or less and a chlorine content less than 1 ppm.

5,486,565

ORGANOSILICON COMPOUNDS AND LOW TEMPERATURE CURING ORGANOSILOXANE COMPOSITIONS CONTAINING SAME

Theresa E. Gentle, and Michael A. Lutz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 2, 1994, Ser. No. 348,425

Int. Cl.[5] C08K *5/54*

U.S. Cl. 524—730 **11 Claims**

1. An organosilicon composition comprising at least one compound formed by the interchange reaction between 1) a polyhydric alcohol of the general formula $R^1(OH)_m$, 2) an alcohol of the general formula $R^2(OH)$, and 3) a silane of the formula $R^3_pSiX_{4-p}$, wherein R^1 is a hydrocarbon radical having a valence of m and no ethylenic unsaturation, R^2 is an organic radical having a valence of n and comprising carbon, hydrogen, and at least one organofunctional substituent selected from the group consisting of $CH_2=CH-$, acryloxy, methacryloxy, epoxy, carboxy, amino, amido, acrylamido, methacrylamido, and mercapto, R^3 is an unsubstituted or substituted monovalent hydrocarbon radical, X represents a hydrolyzable group, m is at least 2, n is at least 1, p is 0 or 1 and wherein each molecule of said compound contains at least two silicon atoms.

5,486,566

SILOXANE GELS

Dimitris E. Katsoulis, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

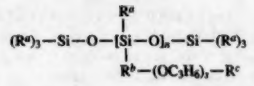
Filed Sep. 23, 1994, Ser. No. 311,246

Int. Cl.[5] A61K *7/02*; **C08K** *5/09*; *5/56*

U.S. Cl. 524—773 **1 Claim**

1. A gel consisting essentially of

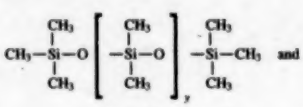
(A) 1–98.9% by weight of the gel of a siloxane polyether with the formula



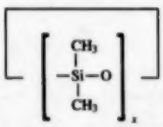
where R^a is an alkyl group of 1–6 carbon atoms; R^b is linking group $—C_mH_{2m}—$; R^c is hydroxyl or alkoxy; m is 2–8;s is 1-30;and n is 1–40;

(B) 0.1–20% by weight of the gel of an amide-free gelator selected from the group consisting of 12-hydroxystearic acid and its metal salts; and

(C) 1–98.9% by weight of the gel of a volatile methyl siloxane with a boiling point less than 250° C., a viscosity of 0.65–5 centistokes, and a formula selected from the group consisting of



and



where x is 3–6 and y is 0–5.

5,486,567

PRIMER COMPOSITIONS

Masatoshi Arai; Yoshifumi Inoue, and Toshiyuki Ozai, all of Matsuida, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1995, Ser. No. 389,196

Claims priority, application Japan, Feb. 15, 1994, 6-040471

Int. Cl.[5] C08L *83/06*

U.S. Cl. 524—863 **6 Claims**

1. A primer composition comprising the following components:

(A) a polyorganosiloxane resin containing at least 0.01 mole of hydroxyl groups per 100 g of the resin represented by the following average composition formula (I):

(I)

wherein R^1, which may be the same or different, represent a substituted or unsubstituted monovalent hydrocarbon group, and a is a value of from 0.4 to 1.8;

(B) at least one compound selected from the group consisting of an alkoxytitanium and a partially hydrolyzed product thereof;

(C) an acid; and

(D) a solvent.

5,486,568

PROTECTED FUNCTIONAL INITIATED POLYMERS CAPPED WITH LOW SURFACE ENERGY FLUOROCARBONS

Robert C. Bening, Katy, and David J. St. Clair, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 20, 1994, Ser. No. 359,805

Int. Cl.[5] C08F *8/18*

U.S. Cl. 525—102 **6 Claims**

1. A process for making heterotelechelic polymers, comprising the steps of:

anionically polymerizing a polymer comprising a conjugated diene with a protected functional initiator; and

capping the polymer with a low surface energy fluorocarbon compound selected from a group consisting of perfluoroaldehydes, perfluoroketones, and perfluoroalkylsilanes.

5,486,569

METHOD OF INCREASING THE SIZE AND/OR ABSORPTION UNDER LOAD OF SUPERABSORBENT POLYMERS BY SURFACE CROSS-LINKING AND SUBSEQUENT AGGLOMERATION OF UNDERSIZED PARTICCLES

John A. Henderson, Birkenhead, United Kingdom; Anthony S. Tomlin, Island Lake, Ill., and David M. Lucas, West Kirby, United Kingdom, assignors to American Colloid Company, Arlington Heights, Ill.

Filed Sep. 28, 1994, Ser. No. 314,363

Int. Cl.[6] C08F *8/32*

U.S. Cl. 525—116 **27 Claims**

1. A method of enhancing the water or aqueous medium absorbance and particle size of water-absorbent, cross-linked polyacrylic polymer particles selected from the group consisting of polyacrylic acid; partially neutralized polyacrylic acid; fully neutralized polyacrylic acid; and mixtures thereof comprising:

contacting the surface of the polyacrylic polymer particles with a solution containing a polyfunctional cross-linking agent capable of cross-linking said polyacrylic polymer;

wherein the solution is surface coated onto the cross-linked polyacrylic polymer particles in a weight ratio of polyacrylic polymer, dry basis, to coating solution in the range of about 1:0.01 to about 1:0.5;

subjecting the coated polyacrylic polymer particles to conditions sufficient to react the cross-linking agent with the surface of the polyacrylic polymer particles to form a polyacrylic polymer having enhanced water absorbance; and

mixing the polyacrylic polymer particles with water, after reaction of the surface of the polyacrylic polymer particles with the cross-linking agent, in a weight ratio of polymer particles, dry basis, to water in the range of about 1:1 to about 1:10 to form a paste; drying the paste to a moisture content less than about 15% by weight; and pulverizing the dried paste to form polyacrylic polymer particles having a size greater than the size of the particles prior to the surface cross-linking reaction.

5,486,570

POLYURETHANE SEALANTS AND ADHESIVES CONTAINING SATURATED HYDROCARBON POLYOLS

David J. St. Clair, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 29, 1994, Ser. No. 315,166

Int. Cl.[6] C08L *75/00;* **C08F** *8/30*

U.S. Cl. 525—123 **20 Claims**

1. A polyurethane composition comprising a polyisocyanate having a functionality of from 2.2 to 10 and a saturated, polyhydroxylated polydiene polymer having a hydroxyl equivalent weight of from 500 to 20,000 wherein the NCO:OH ratio is between 0.3:1 and 0.7:1.

5,486,571

HEAT-SEALABLE AND PEELABLE FILM FOR POLYSTYRENE CONTAINERS AND PROCESS FOR SEALING BY MEANS OF SAID FILM

Jean-Francois Arsac, Pau; Catherine Bonabal, Billere, and Betty Laurent, Bernay, all of, France, assignors to Elf Atochem S.A., Puteaux, France

Division of Ser. No. 286,903, Aug. 8, 1994, Pat. No. 5,432,235, which is a continuation of Ser. No. 960,765, Oct. 14, 1992, abandoned. This application Apr. 12, 1995, Ser. No. 420,809

Claims priority, application France, Jan. 18, 1991, 91 12899

Int. Cl.[6] C08L *33/08;23/08*

U.S. Cl. 525—227 **8 Claims**

1. A heat-sealable and peelable film for polystyrene containers comprising at least one thin film (i) of a mixture which includes, by weight relative to the total mixture, (a) 40 to 70% polystyrene, (b) 30 to 60% of at least one copolymer of ethylene and acrylic ester and (c) zero percent styrene/butadiene/styrene block copolymer.

5,486,572

PROCESS FOR PREPARING PROPYLENE BLOCK COPOLYMERS

Takashi Fujita, and Toshihiko Sugano, both of Yokkaichi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Continuation of Ser. No. 185,233, Jan. 24, 1994, abandoned, which is a continuation of Ser. No. 12,984, Feb. 3, 1993, abandoned, which is a continuation of Ser. No. 727,124, Jul. 9, 1991, abandoned. This application Dec. 1, 1994, Ser. No. 352,199

Claims priority, application Japan, Sep. 27, 1990, 2-258381

Int. Cl.[6] C08F *297/08*

U.S. Cl. 525—247 **27 Claims**

1. A process for preparing propylene block copolymers consisting essentially of:

a preceding polymerization step in which a crystalline homopolymer of propylene, or a propylene-ethylene copolymer containing 7 wt. % or less of ethylene copolymerized is produced in the presence of a catalyst consisting of the following components (A) and (B), and

a succeeding polymerization step in which the polymerization is continued in the presence of at least a part of the product obtained from the preceding polymerization step, and in the presence of the following component (C) which is added after the completion of the preceding polymerization step to give the propylene block copolymer with a polymerization ratio in a weight ratio of propylene to ethylene of from 0/100 to 90/10;

the polymerization amount at the preceding polymerization step being from 30 to 95 wt. % of the total polymerization amount at said preceding and succeeding polymerization steps;

component (A): essentially a solid catalyst component of Ziegler catalysts consisting essentially of titanium, magnesium, a halogen and an electron donor selected from the group consisting of esters of an organic acid, acid halides, organoalkoxysilicons and esters of an inorganic acid:

component (B): an organoaluminum compound;

component (C): a compound selected from the group consisting of a cyclic olefin having 5 to 12 carbon atoms, vinyl tri-lower alkyl silane, a vinyl lower alkyl ether and methyl methacrylate,

the weight ratio of the component (B) to the component (A) being from 1 to 100 and the molar ratio of the component (C) to the titanium contained in the component (A) being from 0.2 to 100.

5,486,573

POLYMER POWDER CROSS-LINKED BY METALLIC IONS AND CONTAINING REINFORCING MATERIAL, PROCESS FOR PRODUCING THE POLYMER POWDER, COMPOSITE MATERIAL BASED ON POLYMER CROSS-LINKED BY METALLIC IONS, AND PROCESS FOR PRODUCING THE COMPOSITE MATERIAL

Kazuo Hamajima, Sunono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 29, 1993, Ser. No. 82,868

Claims priority, application Japan, Jan. 30, 1992, 4-172474; Aug. 6, 1992, 4-210527; Jan. 18, 1993, 5-005687

Int. Cl.[6] C08F *257/00*

U.S. Cl. 525—274 **5 Claims**

1. A process for producing a polymer powder cross-linked by metallic ions and containing reinforcing material, comprising the steps of:

a reinforcing material dispersion step comprising preparing a solution including a polymer raw material cross-linkable by reacting with metallic ions and another solution including the metallic ions, and dispersing a fibrous reinforcing material or a particulate reinforcing material in at least one of the solutions;

a reaction step comprising (i) mixing and reacting said solutions to form a polymer which is cross-linked with said metallic ions and captures said reinforcing material and (ii) precipitating the resulting polymer and captured reinforcing material; and

a separation and desiccation step comprising separating the resulting precipitated polymer and captured reinforcing material from liquid and drying them.

5,486,574

DISSIMILAR ARM ASYMMETRIC RADICAL OR STAR BLOCK COPOLYMERS FOR ADHESIVES AND SEALANTS

Glenn R. Hinze; Bridget A. Spence; Ronald J. Hexamer, and Steven S. Chin, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 149,595, Nov. 9, 1993, Pat. No. 5,393,841. This application Nov. 9, 1994, Ser. No. 336,632

Int. Cl.[6] C08F *297/04*

U.S. Cl. 525—314 **21 Claims**

1. Radial or star asymmetric block copolymers of the formulae (I) $(A—HD)_x—Y—(UD)_z$ (or (II) $(UD—A—HD)_x—Y$ or (III) $(UD)_z—A—HD)_x—Y—(UD)_z$] wherein A is a vinyl aromatic hydrocarbon block having a peak molecular weight as determined by gel permeation chromatography of from 4000 to 20,000, HD is a hydrogenated conjugated diene block having a peak molecular weight as determined by gel permeation chromatography of from 10,000 to 100,000, Y is a multifunctional coupling agent, UD is a partially hydrogenated conjugated diene block having a peak molecular weight as determined by gel permeation chromatography of from 1000 to 80,000, x is an integer from 2 to 20, [y is 0 or 1,] z is an integer from 1 to 20, and x+z ranges from 3 to 30, and the vinyl aromatic hydrocarbon content ranges from 4 to 35 percent by weight.

5,486,575

HIGH PERFORMANCE BLOW MOLDING RESINS AND PROCESS FOR THEIR PREPARATION

Ramesh N. Shroff, Cincinnati, Ohio, assignor to Quantum Chemical Corporation, Cincinnati, Ohio

Filed Mar. 8, 1994, Ser. No. 208,155

Int. Cl.[6] C08F *110/02;210/02*

U.S. Cl. 525—333.8 **14 Claims**

1. In a high shear blow molding process for producing bottles from high density ethylene polymers obtained by the particle form homopolymerization of ethylene or copolymerization of ethylene with a C_{3-8} alpha-olefin using a chromium catalyst and having a density from 0.949 to 0.960, melt index from 0.1 to 1.0, long chain branching index less than 1.9, unsaturation content greater than 0.9 vinyl units per 1000 carbon atoms, and M_z/M_w greater than 10, to increase the top load stress crack resistance and swell characteristics of bottles produced therefrom, the improvement comprising contacting the resin prior to blow molding with 25 to 300 ppm organic peroxide while maintaining the resin in a molten state at a temperature above the decomposition temperature of the organic peroxide.

5,486,576

METHOD FOR REDUCING MICROFOAM IN A SPRAY-APPLIED WATERBORNE THERMOSET COMPOSITION

Gary R. Larson, Hatfield; Caren A. Puschak, Norristown, and Kurt A. Wood, Abington, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 1, 1994, Ser. No. 269,707

The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.

Int. Cl.[7] C08F *8/30*

U.S. Cl. 525—375 **8 Claims**

1. A method for reducing the amount of microfoam in a spray-applied clear waterborne thermoset composition comprising:

forming said clear waterborne thermoset composition comprising an emulsion-polymerized addition polymer with an average particle diameter of greater than about 120 nanometers, said polymer bearing at least two first reactive groups; and a reactive modifier bearing at least two second reactive groups, said second reactive groups being reactive with said first reactive groups to form a covalent bond;

applying said thermoset composition to a substrate using a spray method, whereby a clear coating is formed; and

curing said thermoset composition.

5,486,577

BLENDS OF DIARYL FLUORENE CARBONATE POLYMERS WITH BISPHENOL A CARBONATE POLYMERS

Hani Farah, Sugarland, Tex., and Stephen E. Bales, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1995, Ser. No. 407,930

Int. Cl.[6] C08L *69/00*

U.S. Cl. 525—469 **17 Claims**

1. A carbonate polymer composition comprising a first diaryl fluorene carbonate polymer component and a second bisphenol A carbonate polymer component, different from the diaryl fluorene carbonate polymer component.

5,486,578

CURABLE SILICONE COATINGS CONTAINING SILICONE RESINS

Leslie E. Carpenter, II, Kanagawa, Japan, and Robert A. Ekeland, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 175,830, Dec. 30, 1993, Pat. No. 5,391,673. This application Dec. 20, 1994, Ser. No. 359,311

Int. Cl.[6] C08F *283/00*

U.S. Cl. 525—478 **35 Claims**

1. A curable silicone coating composition comprising:

(A) an organosilicon compound having at least two olefinic hydrocarbon radicals per compound;

(B) at least one organohydrogensilicon compound;

(C) a platinum group metal-containing catalyst; and

(D) a silicone resin prepared by the process of:

(I) mixing in a continuous manner a silane selected from the group consisting of:
(a) a silane having the formula SiX_4 wherein X is a halogen atom or a group having the formula OR wherein R is a group selected from the group consisting of alkyl groups having from 1 to 6 carbon atoms, aryl groups, and arylalkyl groups;
(b) alcohol treated halogenated silanes; and
(c) alkyl silicates having units of the formula

$$\frac{SiO_{\frac{4-d}{2}}(OR^1)_d}{}$$

or a partial hydrolysis condensate thereof, wherein R^1 is a group selected from the group consisting of alkyl groups having from 1 to 6 carbon atoms, aryl groups, and arylalkyl groups, and d has a value of from 1 to 3, with a condensation catalyst;
(II) adding a quenching agent to the reaction mixture of (I), whereby an aqueous layer or condensation catalyst layer and an organic-silicone resin containing layer are formed;
(III) separating the aqueous layer or condensation catalyst layer from the organic-silicone resin containing layer; and
(IV) stripping the organic-silicone resin containing layer, wherein the weight ratio of said silane to said condensation catalyst is constant throughout said process.

5,486,579

WETTABLE SILICONE HYDROGEL COMPOSITIONS AND METHODS FOR THEIR MANUFACTURE

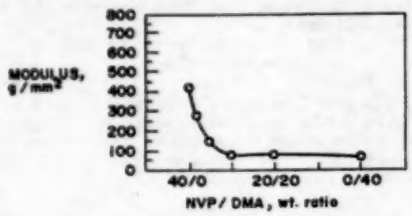
Yu-Chin Lai, and Paul L. Valint, Jr., both of Pittsford, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 922,292, Jul. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 788,013, Nov. 5, 1991, abandoned. This application Apr. 11, 1994, Ser. No. 226,596

The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl.[6] **C08F** *283/12*

U.S. Cl. 525—479 **16 Claims**



1. In a silicone-containing hydrogel composition formed by curing a monomer mixture comprising at least one silicone-containing monomer and a hydrophilic monomer, the improvement of which comprises combining the silicone-containing monomer with N-vinylpyrrolidone and N,N-dimethylacrylamide in the monomer mixture.

5,486,580

MESOGENIC NOVOLACS AND RESINS

Mark D. Newsham, Midland, Mich.; Jimmy D. Earls, and Robert E. Hefner, Jr., both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

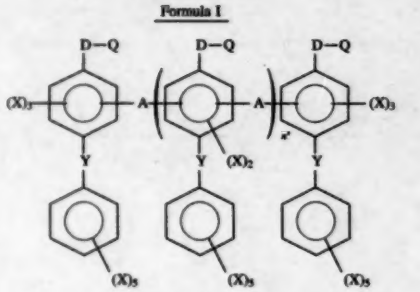
Filed Nov. 2, 1994, Ser. No. 333,897

Int. Cl.[6] **C08L** *61/06*

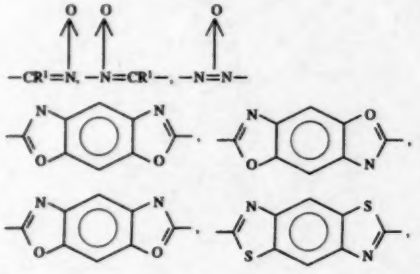
U.S. Cl. 525—504 **13 Claims**

1. A composition comprising
(A) a compound represented by the following Formula I:

Formula I



wherein A is a divalent C_1-C_{12} aliphatic or cycloaliphatic hydrocarbyl group, D is O or NR with the proviso that when R in NR is hydrogen then Q is hydrogen or cyanamide; Q is hydrogen, epoxy, thiirane, vinylester, cyanamide, or cyanate; n' has a value from 1.01 to about 10; X is hydrogen, a hydrocarbyl or hydrocarbyloxy group having from one to about 10 carbon atoms, a halogen atom, a nitro group, a phenyl group, a ketone group, an ester group, a carboxyl acid group with the proviso that when X is a carboxyl group Q is hydrogen, $—SO_2R$, $—SO_2CH_2F$, $—SO_2CHF_2$, $—SO_2CF_3$, $—S(NSO_2CF_3)CF_3$, $—CF_3$, $—COCF_3$, cyano, cyanovinyl, dicyanovinyl, tricyanovinyl; with the proviso that only one X can be a group other than hydrogen; R is hydrogen or a C_1 to C_{20} hydrocarbyl group; and Y is a rigid central linkage group selected from the group consisting of $—CR^1{=}CR^1—$, $—C{\equiv}C—$, $—N{=}N—$, $—CR^1{=}N—$, $—N{=}CR^1—$, $—O—CO—$, $—CO—O—$, $—NR^1—CO—$, $—CO—NR^1—$, $—CR^1{=}N—N{=}CR^1—$, $—CO—O—N{=}CR^1$, $—CR^1{=}N—O—CO—$, $—CO—NR^1—NR^1—OC—$, $—CR^1{=}CR^1—O—OC—$, $—CO—O—CR^1{=}CR^1—$, $—O—OC—CR^1{=}CR^1—$, $—CR^1{=}CR^1—CO—O—$, $—(CHR^1)_x—O—CO—CR^1{=}CR^1—$, $—CR^1{=}CR^1—CO—O—(CHR^1)_x—$, $—(CHR^1)_x—CO—O—CR^1{=}CR^1—$, $—CR^1{=}CR^1—O—CO—(CHR^1)_x—$, $—S—CO—$, $—CO—S—$, $—CH_2—CH_2—CO—O—$, $—O—OC—CH_2—CH_2—$, $—C{\equiv}C—C{\equiv}C—$, $—CR^1{=}CR^1—CR^1{=}CR^1—$, $—CR^1{=}C(—Cl)—$, $—C(—Cl){=}CR^1—$, $CR^1{=}C(—C{\equiv}N)—$, $—C(—C{\equiv}N){=}CR^1—$, $—C(—C{\equiv}N){=}N—$, $—N{=}C(—C{\equiv}N)—$, $—C{\equiv}C—CO—O—$, $—O—CO—C{\equiv}C—$



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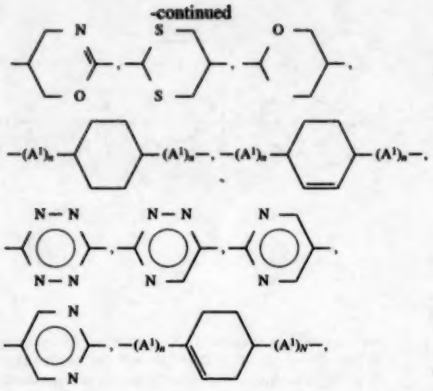

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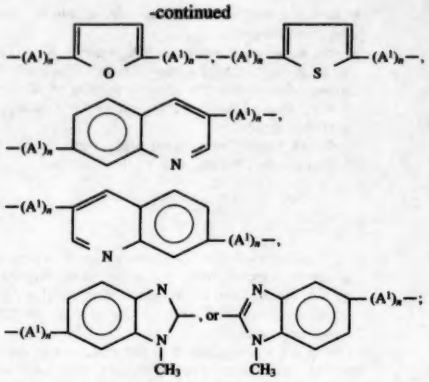
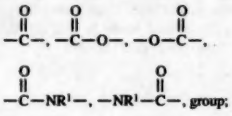


each A^1 is independently a



each R^1 is independently hydrogen or a hydrocarbyl group having from one to about 3 carbon atoms; R^4 is hydrogen or a methyl group; n has a value of zero or one; and n' has a value of 1 or 2; and

(B) optionally, a curing amount of a curing agent or a catalytic amount of a polymerization catalyst and/or a cure accelerating amount of an accelerating agent.

5,486,581

CROSSLINKED POLYKETONE POLYMER

Carlton E. Ash, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 19, 1993, Ser. No. 155,396

Int. Cl.[6] C08G *63/00*

U.S. Cl. 525—539 **7 Claims**

1. A crosslinked composition comprising a linear alternating polyketone polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, and a minor amount of at least one iodide salt, wherein crosslinking is induced by the action of a sufficient amount of heat and oxygen.

5,486,582

POLYMER SCALE PREVENTIVE PROCESS USING A COATING OF CHITOSAN SALT AND PHENOTHIAZINE

Toshihide Shimizu, Urayasu, and Minoru Shigemitsu, Kamisu, both of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 909,220, Jul. 6, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 357,145

Claims priority, application Japan, Jul. 3, 1991, 3-189158

Int. Cl.[6] C08F *2/00*

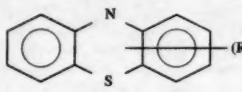
U.S. Cl. 526—62 **6 Claims**

1. A process of producing a polymer by polymerization of a monomer having an ethylenically unsaturated double bond in a polymerization vessel, comprising the step of carrying out said polymerization in a polymerization vessel having on its inner wall surfaces a coating for preventing polymer scale deposition, wherein the coating comprises:

(A) a water-soluble basic polysaccharide

(B) selected from the group consisting of the inorganic acid salts and organic acid salts of chitosans, and

(B) a phenothiazine, wherein the phenothiazine (B) is represented by the general formula:



wherein R may be the same or different where there exist two or more R's and each represent a hydrogen atom, —OH, —Cl, $—CH_3$, $—C_2H_5$, $—COCH_3$, $—COC_2H_3$, $—SO_2CH_3$, $—SO_2C_2H_5$, or $—NO_2$, and n is an integer of 1 to 4.

5,486,583

DEFOAMING COMPOSITIONS FOR ABS LATICES

Herbert Eichenauer, Dormagen; Karl-Erwin Piejko, Bergisch Gladbach; Hans-Jürgen Bunte, Krefeld, and Hans-Jürgen Thiem, Dormagen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 7, 1994, Ser. No. 350,695

Claims priority, application Germany, Dec. 17, 1993, 43 43 207.7

Int. Cl.[6] C08K *5/36;* **B01D** *19/04*

U.S. Cl. 526—68 **5 Claims**

1. A mixture suitable for use as a defoamer comprising:

A) 30 to 85 parts by weight of a C_{10}–C_{20} alcohol;

B) 5 to 30 parts by weight of a mineral oil;

C) 5 to 40 party by weight of an ester from a thiodicarboxylic acid with 4 to 8 carbon atoms and an alcohol with 10 to 20 carbon atoms; and

D) 2 to 15 parts of a non-ionic emulsifier.

3. A process for removing residual monomers from acrylonitrile-butadiene-styrene polymer latices, comprising adding to an acrylonitrile-butadiene-styrene polymer latex a defoaming mixture as claimed in claim 1 and then degassing the latex.

5,486,584

CHROMIUM CATALYST COMPOSITIONS

Rickey D. Badley, Dewey; Elizabeth A. Benham, and Max P. McDaniel, both of Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 8, 1992, Ser. No. 958,668

Int. Cl.[6] C08F *4/22;4/24*

U.S. Cl. 526—95 **12 Claims**

1. A process comprising

producing a copolymer by copolymerizing ethylene and at least one non-ethylene comonomer, wherein said copolymer has a high molecular weight portion that has a molecular weight greater than the weight average molecular weight of said copolymer

with a chromium catalyst composition that comprises at least two chromium catalyst systems, wherein each said chromium catalyst system comprises chromium and a support, and wherein each support comprises silica, and wherein at least two of said chromium catalyst systems have supports that have an average pore radius difference sufficient to preferentially introduce said non-ethylene comonomer into said high molecular weight portion.

5,486,585

AMIDOSILYLDIYL BRIDGED CATALYSTS AND METHOD OF POLYMERIZATION USING SAID CATALYSTS.

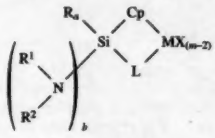
Masahide Murata, Ohi, Japan, and Terry J. Burkhardt, Kingwood, Tex., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Filed Aug. 26, 1993, Ser. No. 112,491

Int. Cl.[6] C08F *4/656*

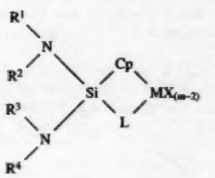
U.S. Cl. 526—130 **19 Claims**

1. A polymerization catalyst system comprising a transition metal catalyst component represented by the formulae:



(1)

or



(2)

wherein L is an anionic ligand and can be

(i) Cp;

(ii) O; or

(iii) NR^3;

wherein:

M is a group 3–6 transition metal;

X is the same or different hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, halocarbyl, substituted halocarbyl, C_{1-20} alkyl, C_{2-20} alkenyl, C_{6-20} aryl, C_{7-40} alkyaryl, C_{7-40} arylalkyl, C_{8-40} arylalkenyl, alkoxy, aryloxy, siloxy, or amide radicals or combinations thereof;

Cp is the same or different cyclopentadienyl ring substituted with from zero to four substituent groups, each group being, independently, the same or different hydrocarbyl, substituted hydrocarbyl, hydrocarbyl substituted silyl group, halocarbyl, substituted halocarbyl, or taken together, two or more adjacent substituents form part of a ring structure having between 2 and 10 carbons;

m is equal to or greater than 2 and is equal to the oxidation state of the transition metal;

R, R^1, R^2, R^3, R^4 are the same or different hydrogen, halogen, C_{1-20} alkyl, C_{2-20} alkenyl, C_{6-20} aryl, C_{7-40} alkylaryl, C_{7-40} arylalkyl, C_{8-40} arylalkenyl, or taken together, two or more adjacent substituents form part of a ring structure having between 2 and 10 carbons;

Si is silicon;

N is nitrogen;

a=b=1, or a=0 when b=2;

and a catalyst activating compound.

5,486,586

ADHESIVES BASED ON POLYVINYL ETHER COPOLYMERS

Hubertus Kroener, Ludwigshafen; Eberhard Schupp, Gruenstadt; Eckehardt Wistuba, Bad Duerkheim; Oral Aydin, Mannheim; Elmar Schwarzenbach, Roemerberg, and Klaus Schnell, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 202,180, Feb. 25, 1994, abandoned. This application May 12, 1995, Ser. No. 440,119

Claims priority, application Germany, Mar. 20, 1993, 43 09 081.8

Int. Cl.[6] C08F *16/12*

U.S. Cl. 526—332 **7 Claims**

1. An adhesive containing 5 to 90% by weight of a polyvinyl ether copolymer having a weight average molecular weight of > 10,000, comprising

a) from 0 to 95% by weight of vinyl ethers of the formula I

$$H_2C{=}CH{-}O{-}R \qquad I$$

b) from 5 to 100% by weight of hydrophilic vinyl ethers of the formula II

$$H_2C{=}CH{-}O{-}R^1 \qquad II$$

and

c) from 0 to 30% by weight of further monomers,

where R is C_1–C_{20}-alkyl and R^1 is an aliphatic or cyclo-aliphatic radical which is substituted by hydroxyl groups or interrupted by nonadjacent groups —Y—, Y is oxygen, sulfur or a group NR^2 or $N{+}R^2R^3X^-$, R^2 and R^3 independently of one another are each hydrogen or C_1–C_4-alkyl and X^- is a counter-anion, and the molar ratio of carbon atoms to the sum of groups Y and hydroxyl groups in the aliphatic or cycloaliphatic radical R^1 is from 1.01 : 1 to 6.5 : 1

optionally in combination with at least one adhesive additive selected from the group consisting of a thickener, a leveling agent, an antifoam agent, a plasticizer and a tackifier.

5,486,587

AQUEOUS LATEXES CONTAINING MACROMONOMERS

Gregory D. Shay, Cary, N.C.; Richard D. Jenkins, Hurricane, and David R. Bassett, Charleston, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 887,671, May 29, 1992, abandoned. This application Aug. 16, 1993, Ser. No. 107,330

Int. Cl.[6] C08F *16/12*

U.S. Cl. 526—333 **22 Claims**

1. A latex composition comprising an aqueous emulsion copolymer of monoethylenically unsaturated monomers which includes from about 0.1 weight % to about 10 weight % of one or more monoethylenically unsaturated macromonomers represented by the formula:

$$R^1{-}(OR^2)_z{-}R^3{-}\underset{\displaystyle R^4}{\underset{|}{C}}{=}CR^5R^6$$

wherein:

R^1 is a monovalent residue of a substituted or unsubstituted complex hydrophobe compound;

each R^2 is the same or different and is a substituted or unsubstituted divalent hydrocarbon residue;

R^3 is a substituted or unsubstituted divalent hydrocarbon residue;

R^4, R^5 and R^6 are the same or different and are hydrogen or a substituted or unsubstituted monovalent hydrocarbon residue; and

z is a value of 0 or greater:

wherein the substituted or unsubstituted complex hydrophobe compound is represented by the formula selected from:

$$\begin{array}{l} R_1{-}(O{-}CH_2)_a \\ \qquad\qquad\diagdown \\ \qquad\qquad R_3{-}(OR_4)_x{-}(OR_5)_y{-}OR_6 \\ \qquad\qquad\diagup \\ R_2{-}(O{-}CH_2)_b \end{array}$$

wherein R_1 and R_2 are the same or different and are hydrogen or a substituted or unsubstituted monovalent hydrocarbon residue, R_3 is a substituted or unsubstituted divalent or trivalent hydrocarbon residue, each R_4 is the same or different and is a substituted or unsubstituted divalent hydrocarbon residue, each R_5 is the same or different and is a substituted or unsubstituted divalent hydrocarbon residue, R_6 is hydrogen, a substituted or unsubstituted monovalent hydrocarbon residue or an ionic substituent, a and b are the same or different and are a value of 0 or 1, and x and y are the same or different and are a value of 0 or greater; provided at least two of R_1, R_2, R_3, R_4, R_5 and R_6 are a hydrocarbon residue having greater than 2 carbon atoms in the case of R_1, R_2 and R_6 or having greater than 2 pendant carbon atoms in the case of R_3, R_4 and R_5; and

$$\begin{array}{l} R_7{-}(OCH_2)_d{-}R_9{-}(OR_{10})_f{-}OR_{11} \\ \qquad\qquad\quad | \\ \qquad\qquad\quad R_{15} \\ \qquad\qquad\quad | \\ R_8{-}(OCH_2)_e{-}R_{12}{-}(OR_{13})_g{-}OR_{14} \end{array}$$

wherein R_7 and R_8 are the same or different and are hydrogen or a substituted or unsubstituted monovalent hydrocarbon residue, R_9 and R_{12} are the same or different and are a substituted or unsubstituted divalent or trivalent hydrocarbon residue, each R_{10} is the same or different and is a substituted or unsubstituted divalent hydrocarbon residue, each R_{13} is the same or different and is a substituted or unsubstituted divalent hydrocarbon residue, R_{11} and R_{14} are the same or different and are hydrogen, a substituted or unsubstituted monovalent hydrocarbon residue or an ionic substituent, R_{15} is a substituted or unsubstituted divalent hydrocarbon residue, d and e are the same or different and are a value of 0 or 1, and f and g are the same or different and are a value of 0 or greater; provided at least two of R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{14} and R_{15} are a hydrocarbon residue having greater than 2 carbon atoms in the case of R_7, R_8, R_{11} an R_{14} or having greater than 2 pendant carbon atoms in the case of R_9, R_{10}, R_{12}, R_{13} and R_{15}.

5,486,588

EPOXY-FUNCTIONAL ORGANOPOLYSILOXANE FROM SIH POLYSILOXANE, UNSATURATED EPOXY COMPOUND AND ALKENE

Yoshitsugu Morita, Chiba, Japan, assignor to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Division of Ser. No. 259,817, Jun. 15, 1994. This application Jun. 5, 1995, Ser. No. 463,578

Claims priority, application Japan, Jun. 29, 1993, 5-185627

Int. Cl.[6] C08G *77/06;77/08*

U.S. Cl. 528—15 **6 Claims**

1. A method for the preparation of an organopolysiloxane having the general formula

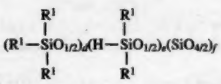
$$\begin{array}{l} \qquad\quad R^1 \qquad\quad R^1 \\ \qquad\quad | \qquad\quad | \\ (R^2{-}SiO_{1/2})_a(R^3{-}SiO_{1/2})_b(SiO_{4/2})_c \\ \qquad\quad | \qquad\quad | \\ \qquad\quad R^1 \qquad\quad R^1 \end{array}$$

wherein R^1 is defined hereinabove; R^2 is selected from the group consisting of hydrogen, monovalent hydrocarbon groups and a halogenated hydrocarbon groups: R^3 is selected from the group consisting of epoxy-functional organic groups, alkoxysilylalkyl groups and alkyl groups having at least 6 carbon atoms; a is zero or a positive number; b is a positive number; c is a positive number; a/c has a value of >4; b/c has a value of 0.05 to 4; and (a+b)/c has a value of zero to 4; with the proviso that neither R^1 nor R^2 is an alkenyl group and that said organopolysiloxane has in its molecule at least one said epoxy-functional organic group and at least one

said alkyl group having at least 6 carbon atoms comprising reacting in the presence of

(A) a hydrosilylation-reaction catalyst:

(B) an SiH-containing organopolysiloxane having the general formula



wherein R^1 is a monovalent group selected from the group consisting of hydrocarbon groups and halogenated hydrocarbon groups, excluding alkenyl groups; d is zero or a positive number; e is a positive number; f is a positive number; d/f has a value of zero to <4; e/f has a value of 0.05 to 4; and (d+e)/f has a value of 0.2 to 4,

(C) an aliphatically unsaturated epoxy-functional organic compound,

(D) an alkene that contains at least 6 carbons, and, optionally,

(E) an alkoxysilylalkene.

5,486,589

ROOM TEMPERATURE VULCANIZABLE ORGANOPOLYSILOXANE COMPOSITION

Yoshio Inoue, Annaka, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1994, Ser. No. 355,771

Claims priority, application Japan, Dec. 14, 1993, 5-342451

Int. Cl.[6] C08G 77/08

U.S. Cl. 528—17 **5 Claims**

1. A room temperature vulcanizable composition which comprises:

(A) 100 parts by weight of a diorganopolysiloxane blocked with a silanol group at both ends of the molecular chain, said diorganopolysiloxane being of the following formula

$HO[(R^1)(R^2)SiO]_nH$

wherein each of R^1 and R^2 independently represents an unsubstituted or substituted monovalent hydrocarbon group selected from a C_{1-8} alkyl group, a C_{2-3} alkenyl group, a C_{6-8} aryl group, a C_{5-7} cycloalkyl group or those groups defined above substituted with a halogen atom or cyano group for one to all of the hydrogen atoms bonded to the carbon atoms thereof, and n is an integer of 5 or more;

(B) from 0.01 to 10 parts by weight of an organopolysiloxane having at least three silanol groups in the molecule, and is of the following formula

$R^3O[(R)_2SiO]_m[(R/(OH)SiO]_k[(R)_2SiO]R^3$

wherein each R independently represents an unsubstituted or substituted monovalent hydrocarbon group selected from a C_{1-8} alkyl group, a C_{2-3} alkenyl group, a C_{6-8} aryl group or those groups defined above substituted with a halogen or cyano group for one to all of the hydrogen atoms bonded to the carbon atoms thereof, both R^3 are hydrogen atoms or the group $(R)_3Si$, k is an integer of 3 or over, and m is an integer of 1 or over; and

(C) from 0.5 to 30 parts by weight of at least one member selected from the group consisting of organosilanes and organopolysiloxanes each having two hydrolyzable groups in one molecule, the at least one member serving to crosslink said diorganopolysiloxane and said organopolysiloxane therethrough.

5,486,590

SULFONATED POLYETHYLENE REARRANGEMENT OF POLYORGANOSILOXANES

Israel Cabasso, Syracuse, N.Y., and Daniel Graiver, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 9, 1995, Ser. No. 386,040

Int. Cl.[6] C08G 77/08

U.S. Cl. 528—23 **12 Claims**

1. A process for siloxane bond rearrangement of polyorganosiloxanes, the process comprising:

contacting a polyorganosiloxane at a temperature within a range of about 20° C. to 110° C. with a rearrangement catalyst consisting essentially of solid sulfonated polyethylene.

5,486,591

BIOPOLYMERS DERIVED FROM HYDROLYZABLE DIACID FATS

Abraham J. Domb, Gush Ezion, and Raphael Nudelman, Rehovot, both of, Israel, assignors to Yissum Research Development Co. of the Hebrew University of Jerusalem, Jerusalem, Israel

Division of Ser. No. 168,457, Dec. 16, 1993. This application Mar. 21, 1995, Ser. No. 407,183

Int. Cl.[6] C08G 63/02;63/44;69/00

U.S. Cl. 528—272 **6 Claims**

1. A polymer essentially consisting of repeating units of a monomeric diacid derivative comprising at least two fatty acids coupled by a hydrolytically or enzymatically degradable bond whereby said degradable bond in a biological environment degrades forming naturally occurring fatty acid products.

5,486,592

COPOLYOXADIAZOLES OF BLOCK TYPE AND PROCESS FOR THEIR SYNTHESIS

Thierry Brifaud, Aizenay, and Jean-Marc Sage, Oullins, both of, France, assignors to Elf Atochem S.A., France

PCT No. PCT/FR94/00037, § 371 Date Oct. 6, 1994, § 102(e) Date Oct. 6, 1994, PCT Pub. No. WO94/15994, PCT Pub. Date Jul. 21, 1994

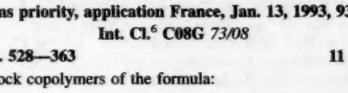
PCT Filed Jan. 12, 1994, Ser. No. 256,899

Claims priority, application France, Jan. 13, 1993, 93 00257

Int. Cl.[6] C08G 73/08

U.S. Cl. 528—363 **11 Claims**

1. Block copolymers of the formula:



in which

R represents an aliphatic residue, A an aromatic residue

x is such that the inherent viscosity (measured in methanesulphonic acid at a concentration of 0.2 g per deciliter at 30° C.) in deciliters per gram is greater than 0.6

n and n' are greater than or equal to 2 and having two glass transition temperatures, with one glass transition temperature being between −50° and +50° C. and the other glass transition temperature being between 180° and 300° C.

5,486,593

MEDICAL DEVICES FABRICATED FROM COPOLYMERS HAVING RECURRING CARBONATE UNITS

Reginald T. Tang, Warren; Frank Mares, Whippany; William J. Boyle, Jr., Parsippany; Tin-Ho Chiu, Millburn, and Kundanbhai M. Patel, Landing, all of N.J., assignors to United States Surgical Corporation, Norwalk, Conn.

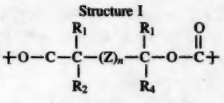
Continuation of Ser. No. 301,149, Sep. 6, 1994, Pat. No. 5,412,068, which is a continuation of Ser. No. 146,548, Nov. 1, 1993, abandoned, which is a continuation of Ser. No. 917,242, Jul. 22, 1992, Pat. No. 5,274,074, which is a division of Ser. No. 833,206, Feb. 10, 1992, Pat. No. 5,152,781, which is a division of Ser. No. 466,109, Jan. 16, 1990, Pat. No. 5,145,945, which is a division of Ser. No. 227,386, Aug. 2, 1988, Pat. No. 4,920,203, which is a continuation-in-part of Ser. No. 134,290, Dec. 17, 1987, abandoned, and a continuation-in-part of Ser. No. 134,321, Dec. 17, 1987, Pat. No. 4,891,263, and a continuation-in-part of Ser. No. 134,339, Dec. 17, 1987, Pat. No. 5,120,802. This application Sep. 23, 1994, Ser. No. 311,301

Int. Cl.[6] C08G *63/91;64/00;63/08*

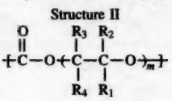
U.S. Cl. 528—370 **21 Claims**

1. A medical device formed totally or in part of one or more biopolymers selected from the group consisting of copolymers containing repeating units derived from a dioxanone and at least one recurring monomeric unit of the following General Structures I and II:

Structure I



Structure II



wherein:

Z is ~~[~~$C(R_5R_6)$~~]~~, ~~[~~NR_5~~]~~, —O— or a combination thereof, where Z is selected such that there are no adjacent heteroatoms;

n is from 1 to about 8;

m is from 1 to about 8;

R_1, R_2, R_3, and R_4 are the same or different at each occurrence and are hydrogen, aryloxyalkyl, alkoxyaryl, aryloxyaryl, arylalkyl, alkylarylalkyl, arylalkylaryl, alkylaryl, arylcarbonylalkyl, alkyl, aryl, alkylcarbonylalkyl, cycloalkyl, arylcarbonylaryl, alkylcarbonylaryl, alkoxyalkyl, or aryl or alkyl substituted with one or more biologically compatible substituents; and

R_5 and R_6 are the same or different and are R_1, R_2, R_3, R_4, dialkylamino, diarylamino, alkylarylamino, alkoxy, aryloxy, alkanoyl, or arylcarbonyl, or any two of R_1 to R_6 together may form an alkylene chain completing a 3, 4, 5, 6, 7, 8 or 9 membered alicyclic fused, spiro, bicyclic and/or tricyclic ring system, which system may optionally include one or more non-adjacent carbonyl, oxa, alkylaza or acylaza groups.

5,486,594

POLYKETONE POLYMERS AS NYLON TOUGHNERS

Randall P. Gingrich, Houston; Michelle Londa, Sugar Land, and John E. Flood, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 11, 1994, Ser. No. 273,552

Int. Cl.[6] C08G *79/02*

U.S. Cl. 528—392 **3 Claims**

1. A toughened polyamide composition comprising polyamide selected from the group consisting of Nylon 6, Nylon 11, and Nylon 12 and a toughener comprising of between about 15 and 20% wt of an alternating polymer of a carbon monoxide and at least one or more ethylenically unsaturated hydrocarbons (based on total weight of said composition).

5,486,595

TUMOR NECROSIS FACTOR INHIBITORS

George A. Heavner, Malvern, Pa., assignor to Centecor, Inc., Malvern, Pa.

Filed Apr. 1, 1994, Ser. No. 221,583

Int. Cl.[6] C07K *5/00;7/00;17/00*

U.S. Cl. 530—324 **5 Claims**

1. A peptide which consists of SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:42, SEQ ID NO:43, SEQ ID NO:44, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:47, SEQ ID NO:48, SEQ ID NO:49, SEQ ID NO:50, SEQ ID NO:51, SEQ ID NO:52, SEQ ID NO:53, SEQ ID NO:54, SEQ ID NO:55, SEQ ID NO:56, SEQ ID NO:57, SEQ ID NO:58, SEQ ID NO:59, SEQ ID NO:60, SEQ ID NO:61 or SEQ ID NO:62.

5,486,596

ANALOGUES OF 8-D-HOMOARGININE VASOPRESSIN

Zdenko Procházka; Ivo Bláha; Miroslava Žertová; Jiřina Slaninová; Jiří, cu i Velek; Jana Škopková; Michal Lebl, all of Prague; Tomislav Barth, Roztoky u Prahy; Lenka Maletínská, Prague, all of, Czechoslovakia, and Hans Vilhardt, Espergarde, Denmark, assignors to Ceskoslovenska akademie ved, Czechoslovakia

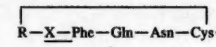
Continuation of Ser. No. 873,967, Apr. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 564,538, Aug. 7, 1990, abandoned. This application Aug. 25, 1993, Ser. No. 111,815

Claims priority, application Czechoslovakia, Aug. 7, 1989, 4705-89; Aug. 18, 1989, 4860-89

Int. Cl.[6] A61K *38/00;* **C07K** *7/06;7/00*

U.S. Cl. 530—329 **3 Claims**

1. Analogues of 8-D-homoarginine vasopressin of the general formula



where X is

L-O-methyltyrosine

L-p-ethylphenylalanine

D-p-ethylphenylalanine

L-p-methylphenylalanine

D-p-methylphenylalanine

and R is cysteine or β-mercaptopropionic acid.

5,486,597

TETRAPEPTIDE DERIVATIVES AND ANALOGUES

Sarkis B. Kalindjian, Banstead; Howard B. Broughton, Essex; Caroline M. R. Low, Croydon; Iain M. McDonald, Paddock Wood; Robert A. D. Hull, Tonbridge; Nigel P. Shankley, Nr. Edenbridge; Ildiko M. Buck, London; Katherine I. M. Steel, Harlow, and Jonathan M. R. Davies, Fort Talbot, all of, United Kingdom, assignors to James Black Foundation Limited, Dulwich, United Kingdom

PCT No. PCT/GB91/02249, § 371 Date Jun. 17, 1993, § 102(e) Date Jun. 17, 1993, PCT Pub. No. WO92/11284, PCT Pub. Date Jul. 9, 1992

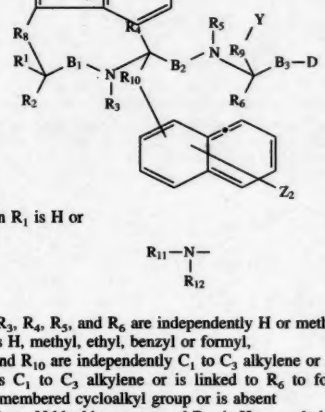
PCT Filed Dec. 17, 1991, Ser. No. 75,528

Claims priority, application United Kingdom, Dec. 17, 1990, 9027286; Nov. 1, 1991, 9123231

Int. Cl.[6] A61K *38/00;* **C07K** *5/00;7/00;17/00*

U.S. Cl. 530—331 **24 Claims**

1. A compound of the formula:



(I)

wherein R_1 is H or

R_2, R_3, R_4, R_5, and R_6 are independently H or methyl,

R_7 is H, methyl, ethyl, benzyl or formyl,

R_8 and R_{10} are independently C_1 to C_3 alkylene or are absent,

R_9 is C_1 to C_3 alkylene or is linked to R_6 to form a 3- to 6-membered cycloalkyl group or is absent

R_{11} is an N-blocking group and R_{12} is H or methyl, or R_{11} and R_{12} are linked to form an N-blocking group

B_1, B_2 and B_3 are independently $—CH_2—$ or a carbonyl group,

Y is $—CO_2H$, tetrazole or $CONR_{13}R_{14}$ (wherein R_{13} and R_{14} are independently H or C_1 to C_6 hydrocarbyl)

Z_1 and Z_2 (which may be the same or different) are optional and each represents one or more substituents in the aromatic ring system, such substituents being independently selected from C_1 to C_6 alkyl (two such alkyl substituents optionally forming a ring fused to one or both of the aromatic rings), C_1 to C_6 alkoxy, C_1 to C_6 thioalkoxy, carboxy, C_1 to C_6 carboalkoxy, nitro, trihalomethyl, hydroxy, $—NR_{15}R_{16}$ (wherein R_{15} and R_{16} are independently H or C_1 to C_6 alkyl), C_1 to C_6 alkylaryl, C_1 to C_6 alkyl (substituted aryl), halo, sulphonamide and cyano

and D is —O—R_{17}—Q or

(wherein Q is H or a carbocyclic or heterocyclic group which may optionally be substituted; R_{17} is absent or is C_1 to C_{10} hydrocarbylene, optionally substituted by —OH, —SH, halogen, $—CO_2R_{19}$ or $—CONR_{19}R_{20}$ (wherein R_{19} and R_{20} are independently H or C_1 to C_6 hydrocarbyl), and optionally having up to three carbon atoms replaced by —O—, —S— or $—NR_{21}—$ (wherein R_{21} is H or an N-blocking group), provided that R_{17} contains at least one carbon atom if Q is H and that R_{17} does not contain —O—O—; and R_{18} is H or C_1 to C_6 alkyl or forms an alkylene (e.g. C_1 to C_4 alkylene) link to Q)

or a pharmaceutically acceptable salt thereof.

5,486,598

SILICA MEDIATED SYNTHESIS OF PEPTIDES

Jon K. West, and Larry L. Hench, both of Gainesville, Fla., assignors to University of Florida, Gainsville, Fla.

Filed May 20, 1994, Ser. No. 246,827

Int. Cl.[6] B01J *21/06;* **C07K** *1/02;1/10*

U.S. Cl. 530—338 **18 Claims**

1. A method of synthesizing a polypeptide comprising forming an aqueous reaction medium containing a first amino acid or peptide, a second amino acid or peptide and a hydrated silica entity containing silanol groups (HSE) in amounts and under conditions such that (1) at least one silanol group of said HSE undergoes a condensation reaction with a —COOH or $—NH_2$ group of one of said first amino acid or peptide to form a Si—O—CO— or Si—N—C— linkage, respectively, therewith and (2) thereafter, said second amino acid or peptide undergoes a condensation reaction with said HSE at said Si—O—CO— or Si—N—C— linkage via a $—NH_2$ or —COOH group, respectively, to form a peptide linkage, —OC—N—C—, in said polypeptide.

5,486,599

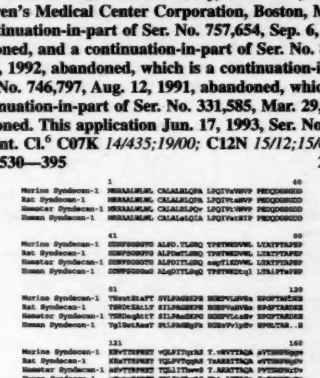
CONSTRUCTION AND USE OF SYNTHETIC CONSTRUCTS ENCODING SYNDECAN

Scott Saunders; Merton Bernfield, and Masato Kato, all of Boston, Mass., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif., and Children's Medical Center Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 757,654, Sep. 6, 1991, abandoned, and a continuation-in-part of Ser. No. 856,869, Mar. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 746,797, Aug. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 331,585, Mar. 29, 1989, abandoned. This application Jun. 17, 1993, Ser. No. 78,683

Int. Cl.[6] C07K *14/435;19/00;* **C12N** *15/12;15/62*

U.S. Cl. 530—395 **21 Claims**



1. A proteoglycan recombinantly-produced by a transformed eukaryotic host cell capable of producing heparan sulfate glycosaminoglyycans, which proteoglycan has a heparan sulfate glycosaminoglyycan chain attached thereto, wherein the proteoglycan is selected from

(1) compounds of

(a) a first formula represented by residues of 23-311 of SEQ ID NO: 2,

(b) a second formula in which one to five amino acids residues in said first formula are replaced by different amino acids, wherein said replacement amino acids do not substantially alter attachment of a syndecan hoporan sulfate glycosaminoglycan chain to the proteoglycan,

(c) a third formula in which from 1 to 10 amino acids are absent from either the amine terminal, the carboxy terminal, or both terminals of said first formula or said second formula or said third formula, or

(d) a fourth formula in which from 1 to 10 addition amine acids are attached sequentially to the amine terminal, carboxy terminal, or both terminals of said first formula, said second formula, or said third formula; and

(2) salts of compounds having said formulas.

5,486,600

FIBER-REACTIVE HALOTRIAZINYL OR HALOPYRIMIDINYL DISAZO DYES

Rolf Deitz, Basel, and Athanasios Tzikas, Pratteln, both of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

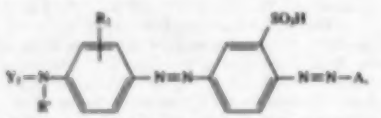
Filed Jul. 19, 1993, Ser. No. 94,646

Claims priority, application Switzerland, Jul. 23, 1992, 2318/92

Int. Cl.[6] C09B 62/513;62/09; D06P 1/38

U.S. Cl. 534—634 **17 Claims**

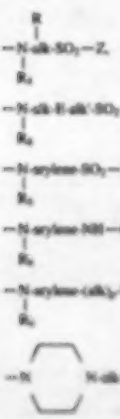
1. A reactive dye of the formula


(1)

in which R' and R_1 are each hydrogen, Y_1 is a halotriazine reactive radical of the formula

(2)

in which X is chlorine or fluorine and T is a fibre-reactive radical of the formula


(4a)

(4b)

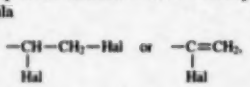
(4c)

(4d)

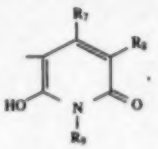
(4e) or

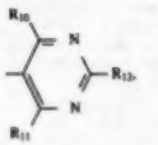
(4f)

in which W is a group of the formula —CONH—, R is hydrogen, R_9 is hydrogen or C_1–C_4alkyl, R_8 is hydrogen, methyl or ethyl, Z is a group of the formula —CH=CH_2 or —CH_2—CH_2—U_1, U_1 is a group of the formula —Cl or —OSO_3H, Z_1 is a group of the formula

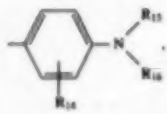


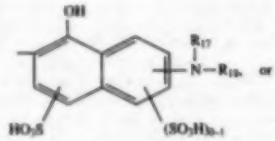
Hal is bromine, E is the radical —O— or —NH—, alk and alk' independently of one another are C_1–C_4alkylene, arylene is a 1,3- or 1,4-phenylene radical which is unsubstituted or substituted by sulfo, carboxyl, methyl or methoxy or is naphthylene and p is 0, and A is a radical of the formula

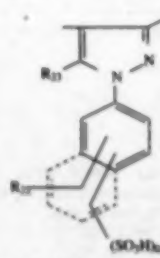

(5)


(6)

(7)


(8)


(9)


(11)

wherein R_7 and R_9 independently of one another are C_1–C_4alkyl, R_8 is cyano, carbamoyl or sulfomethyl, R_{10} and R_{11} independently of one another are hydroxyl, amino or amino which is substituted by C_1–C_4alkyl, in which the alkyl radical is unsubstituted or further substituted by hydroxyl, sulfo or sulfato and, with the exception of methyl, can be interrupted by oxygen, R_{12} is

hydroxyl, phenyl or amino which is unsubstituted or substituted by cyano, R_{13} is hydrogen, amino or N—C_1–C_4alkylamino, R_{14} is hydrogen, C_2–C_6alkanoylamino or ureido, R_5 and R_{16} independently of one another are hydrogen, a halotriazine reactive radical of the formula (2) or C_1–C_8alkyl which is unsubstituted or substituted by hydroxyl, sulfo, sulfato or phenyl, in which the phenyl radical is unsubstituted or substituted by sulfo, R_{17} is hydrogen, R_{18} is C_2–C_6alkanoyl, benzoyl which is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, C_2–C_4alkanoylamino, halogen or sulfo or is a halotriazine reactive radical of the formula (2), R_{21} is C_1–C_4alkyl, R_{22} hydrogen and R_{23} is amino.

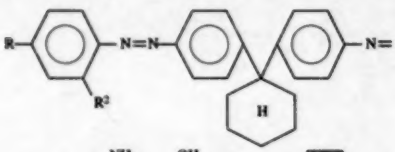
5,486,601

TRISAZO DYE, AND AQUEOUS INK COMPOSITION CONTAINING THE SAME

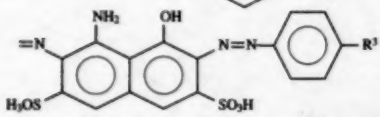
Tatsuya Yagyu, Neyagawa, and Takashi Ono, Takatsuki, both of, Japan, assignors to Orient Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 28, 1994, Ser. No. 314,001
Claims priority, application Japan, Sep. 29, 1993, 5-242597
Int. Cl.[6] C09B *35/46;* **C09D** *11/00*
U.S. Cl. 534—666 **11 Claims**

1. A trisazo dye represented by the formula:



(I)



wherein R^1 and R^2 independently represent a hydrogen atom, a hydroxyl group, a carboxyl group, an amino group, an alkyl group having 1 to 4 carbon atoms, a substituted amino group which is substituted with a hydroxyalkyl group or an acyl group, or an alkoxy group having 1 to 4 carbon atoms; and R^3 represents a hydrogen atom, an alkyl or alkoxy group having 1 to 6 carbon atoms; provided that both R^1 and R^2 are not amino groups nor substituted amino groups.

5,486,602

GENES ENCODING SERINE PROTEASE MUTANTS OF THE CHYMOTRYPSIN SUPERFAMILY RESISTANT TO INHIBITION BY THEIR COGNATE INHIBITORS

Joseph F. Sambrook; Edwin L. Madison; Elizabeth J. Goldsmith, and Maryjane H. Gething, all of Dallas, Tex., assignors to The Board of Regents of the University of Texas System, Austin, Tex.

Division of Ser. No. 589,554, Sep. 28, 1990, Pat. No. 5,304,482, which is a continuation-in-part of Ser. No. 434,748, Nov. 13, 1989, which is a continuation-in-part of Ser. No. 319,212, Mar. 6, 1989, abandoned. This application Dec. 17, 1993, Ser. No. 168,366
Int. Cl.[6] C12N *15/58;9/64*
U.S. Cl. 536—23.2 **5 Claims**

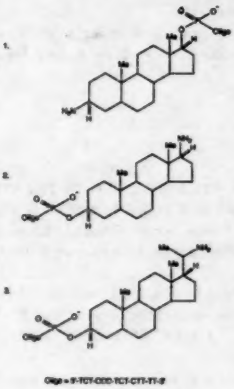
1. A gene encoding a mutant of t-PA, wherein in said mutant, the phenylalanine in t-PA which corresponds to histidine at position 40 of trypsin has been replaced by a basic amino acid, and the alaline in t-PA which corresponds to serine at position 32 of trypsin has been replaced by serine.

5,486,603

OLIGONUCLEOTIDE HAVING ENHANCED BINDING AFFINITY

Chris A. Buhr, Daly City, Calif., assignor to Gilead Sciences, Inc., Foster City, Calif.

Continuation of Ser. No. 461,884, Jan. 8, 1990, abandoned. This application Jun. 22, 1992, Ser. No. 902,538
Int. Cl.[6] C07H *15/12;17/00;* **C07J** *41/00;31/00*
U.S. Cl. 536—24.3 **32 Claims**



1. An oligonucleotide conjugate comprising an oligonucleotide containing from about 2 to about 30 nucleotides or analog thereof conjugated to a molecule at a terminal 2', 3' or 5' position of the oligonucleotide, which molecule comprises a rigid structure consisting of:

(a) a cyclic ring portion containing from about 2 to about 6 n-membered rings where n=4–8;

(b) a first terminal amine wherein said amine is directly attached to, or is attached to a carbon atom that is directly attached to said cyclic ring portion; and

(c) a second terminal group consisting of a phosphate, a second amine or a cationic sulphur wherein said second terminal group is contained within, is directly attached to, or is attached to an atom that is directly attached to said cyclic ring portion or the first terminal amine;

wherein said cyclic ring portion may be a substituted derivative thereof having methyl or lower alkyl groups at any position other than those positions attaching said first terminal amine and containing or attaching said second terminal group.

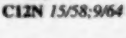
5,486,604

CYCLIC ADP RIBOSE ANTAGONISTS

Timothy F. Walseth, Roseville; Hon-Cheung Lee, Woodbury, and Robert A. Aarhus, Brooklyn Park, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Nov. 1, 1993, Ser. No. 148,646
Int. Cl.[6] C07H *19/23;* **A61K** *51/00*
U.S. Cl. 536—26.13 **4 Claims**

1. A compound of the formula:



wherein

X is selected from the group consisting of amino, azido, Br or a pharmaceutically acceptable acid addition salt thereof.

5,486,605

HYDROGEN SULFIDE CONVERTER

Larry W. Gatlin, Rte. 2, Box 1014, Hwy. 1301, Floresville, Tex. 78114

Continuation-in-part of Ser. No. 51,185, Apr. 22, 1993, abandoned, which is a continuation of Ser. No. 728,522, Jul. 11, 1991, abandoned. This application May 20, 1994, Ser. No. 247,149

Int. Cl.[6] C07H 5/04 5/06 1/00

U.S. Cl. 536—88.2 13 Claims

1. The reaction product of:

a. amine loads, with

b. a second component comprising an aldose selected from the group consisting of D-aldoses having from 3 to 6 carbon atoms.

5,486,606

CELLULOSIC POLYMER, BLOOD-TREATING DEVICE, AND PROCESS FOR PRODUCING THE SAME

Shingo Emi, Osaka; Kyoji Suzuki, Shizuoka, and Yoshito Ikada, Uji, all of, Japan, assignors to Teijin Limited, Osaka, Japan

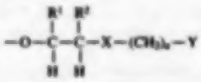
Filed May 4, 1993, Ser. No. 57,094

Claims priority, application Japan, May 8, 1992, 4-115089

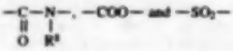
Int. Cl.[6] B01D 61/24 61/28

U.S. Cl. 536—84 4 Claims

1. A blood treating device comprising a cellulosic polymer which contacts blood wherein a DA (phosphorous) improving number of hydroxyl groups on at least one portion of the cellulosic polymer which contacts the blood are modified as represented by the formula:



wherein R^1 and R^2 may be the same or different and each represents a hydrogen atom or a C_1 to C_3 alkyl group, X is a member selected from the groups consisting of



R_3 is a member selected from the group consisting of a hydrogen atom, a C_1 and C_3 group, a C_3 to C_6 cycloalkyl group, and a C_6 to C_{10} alkyl group,

wherein R^3 and R^4 may be the same or different and each represents a member selected from the group consisting of a hydrogen atom, a C_1 and C_5 alkyl group and a C_3 to C_6 cycloalkyl group, or Y is

wherein R^5, R^6 and R^7 may be the same or different and each represents a member selected from the group consisting of a hydrogen atom, a C_1 to C_5 alkyl group, a C_3 to C_6 cycloalkyl group and a C_6 to C_{10} aryl group, and n is integer of 2 to 10.

5,486,607

DIOXAZINE BLUE DYE COMPOUND HAVING VINYLSULFONE TYPE FIBER REACTIVE GROUPS

Tetsuya Miyamoto, Takatsuki; Miyao Takahashi, Minoo; Takahiko Fujisaki, Takarazuka; Naoki Harada, Suita; Yutaka Kayano, Ibaraki, and Takashi Omura, Kobe, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

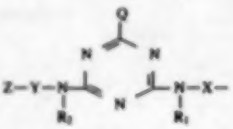
Continuation of Ser. No. 40,587, Mar. 31, 1993, abandoned, which is a continuation of Ser. No. 868,193, Mar. 26, 1992, abandoned, which is a continuation of Ser. No. 489,863, Mar. 5, 1990, abandoned, which is a continuation of Ser. No. 292,256, Dec. 30, 1988, abandoned. This application Jan. 27, 1995, Ser. No. 379,828

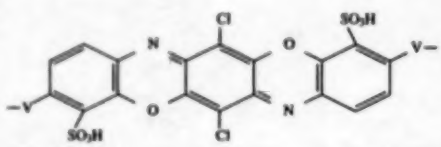
Claims priority, application Japan, Jan. 20, 1988, 63-11689

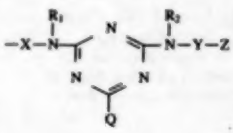
Int. Cl.[6] C07D 498/04

U.S. Cl. 544—76 11 Claims

1. A dioxazine compound represented by the following formula in the free acid form,







wherein

V—X is a direct linkage, —NHC_2H_4—, —NHC_3H_6— or —NH-phenylene unsubstituted or substituted once or twice by sulfo,

Y is phenylene unsubstituted or substituted once or twice by methyl, ethyl, methoxy, ethoxy, chloro, bromo, sulfo or carboxy, or naphthylene unsubstituted or substituted once by sulfo, Z is —SO_2CH=CH_2 or —$SO_2CH_2CH_2Z_1$ in which Z_1 is a group capable of being split by the action of an alkali, Q is amino, carboxymethylamino, N,N-dihydroxymethylamino, ethylamino, β-carboxyethylamino, β-hydroxyethylamino, β-methoxyethylamino, β-sulfoethylamino, N-(β-sulfoethyl)-N-methylamino, N,N-diethylamino, N,N-di-β-hydroxyethylamino, phenylamino, N-ethyl-N-phenylamino, toluidino, anisidino, 2-, 3- or 4-sulfoanilino, 2,4- or 2,5-disulfoanilino, 2-carboxy-5 -sulfophenylamino, 3,6-disulfonaphthyl-(1)-amino, 3,6,8-trisulfonaphthyl-(1)-amino, 4,8 -disulfonaphthyl-(2)-amino, 3,6,8-trisulfonaphthyl-(2)-amino or morpholino, and R_1 and R_2 independently of one another are each hydrogen or alkyl of 1 to 4 carbon atoms.

5,486,608

CATIONIC COMPOUNDS, THEIR PREPARATION AND THE USE THEREOF FOR THE PHOTOCHEMICAL STABILISATION OF BASIC DYEABLE POLYAMIDE FIBRE MATERIALS

Jean-Marie Adam, Rosenau, France, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

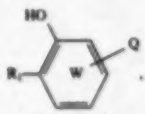
Filed Dec. 15, 1993, Ser. No. 168,012

Claims priority, application Switzerland, Dec. 17, 1992, 3858/92

Int. Cl.[6] C07D *293/037*

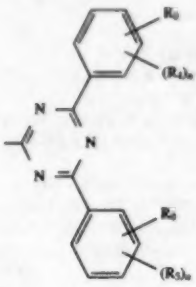
U.S. Cl. 544—108 **6 Claims**

1. A cationic compound of the formula

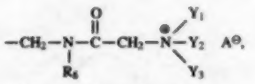


(1)

wherein R_1 is the radical of the formula



(2)



(3)

and the benzene ring W, in addition to being substituted by R_1, —OH and Q, is unsubstituted or is substituted by C_1–C_6alkyl or C_1–C_4alkoxy, and wherein

R_0 is hydrogen or hydroxy,

R_2 is hydrogen, halogen,

$R_4$and R_5 are each independently of the other hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy or halogen, or, when R_0 is hydroxy and n is 1, are also the group of formula Q,

R_6 is hydrogen or C_1–C_4alkyl, and

n is 1 or 2; or,

when R_1 is a radical of the formula (2),

Y_1 is unsubstituted C_1–C_4alkyl or C_1–C_4alkyl which is substituted by halogen, cyano, hydroxy or C_1–C_4alkoxy,

Y_2 is unsubstituted C_1–C_4alkyl or C_1–C_4alkyl which is substituted by halogen, cyano, hydroxy or C_1–C_4alkoxy,

Y_3 is hydrogen, unsubstituted C_1–C_4alkyl or C_1–C_4alkyl which is substituted by cyano, hydroxy, C_1–C_4alkoxy, phenyl or C_1–C_4alkoxycarbonyl, or is C_3–C_4alkenyl,

or Y_1 together with Y_2 and the linking N-atom, form a morpholino ring, and Y_3 is hydrogen, unsubstituted C_1–C_4alkyl or C_1–C_4alkyl which is substituted by cyano, hydroxy, C_1–$_4$alkoxy, phenyl or C_1–C_4alkoxycarbonyl, is C_3–C_4alkenyl,

or Y_1, Y_2 and Y_3, together with the linking N-atom, form an unsubstituted or a C_1–C_4alkyl-substituted pyridinyl or quinolinyl radical; or

$A^{\ominus}$ is a colourless anion.

5,486,609

PREPARATION OF CARBOCYLIC M-AMINOHYDROXYAROMATICS

Robert Reinhardt, Meckenheim; Helmut Reichelt, Neustadt, and Roland Merger, Bad Schönborn, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 24, 1995, Ser. No. 409,713

Claims priority, application Japan, Mar. 26, 1994, 44 10 660.2

Int. Cl.[6] C07D *265/30*

U.S. Cl. 544—173 **6 Claims**

1. A process for preparing carbocyclic m-aminohydroxyaromatics, which comprises reacting carbocyclic o— or m-halohydroxyaromatics or metal salts thereof with primary or secondary amines in the presence of a base and in the presence or absence of a diluent.

5,486,610

PYRIMIDYLBENSULFONYL CHLORIDE COMPOUNDS

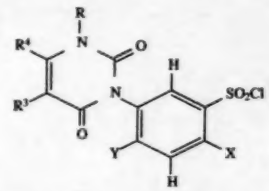
Richard J. Strunk, and Allyn R. Bell, both of Cheshire, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Division of Ser. No. 987,511, Dec. 7, 1992, Pat. No. 5,324,854, which is a division of Ser. No. 742,957, Aug. 9, 1991, Pat. No. 5,169,430. This application Mar. 17, 1994, Ser. No. 214,932

Int. Cl.[6] C07D *239/54;* **A01N** *43/54*

U.S. Cl. 544—311 **1 Claim**

1. A pyrimidinylbenzenesulfonyl chloride compound of the structural formula



wherein R is hydrogen, C_1–C_4 alkyl, or C_1–C_4 haloalkyl;

X is C_1–$_4$ alkyl, C_1–C_8 alkoxy, or halogen;

Y is hydrogen or halogen;

R^3 is hydrogen, halogen or C_1–C_4 alkyl; and

R^4 is C_1–$_4$ alkyl or C_1–C_4 haloalkyl.

5,486,611

CARBOXAMIDO-(1,2N)-CARBOCYCLIC-2-AMINOTETRALIN DERIVATIVES

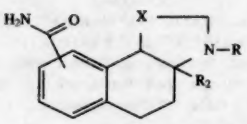
Chiu-Hong Lin, Portage, Mich.; Susanne R. Haadsma-Svensson, Gothenburg, Sweden; Robert B. McCall, Kalamazoo, Mich.; Arthur G. Romero, Kalamazoo, Mich.; William H. Darlington, Kalamazoo, Mich., and Michael D. Ennis, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 702,814, May 20, 1991, abandoned, and a continuation-in-part of Ser. No. 803,287, Dec. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 379,526, Jul. 13, 1989, abandoned. This application Oct. 28, 1993, Ser. No. 144,851

Int. Cl.[6] C07D *209/60;* **A61K** *31/40*

U.S. Cl. 546—62 **18 Claims**

1. A compound having the Formula



I

wherein X is $-(CH_2)_n-$ or $-C(R_1)(H)-$; R is C_1–C_8 alkyl; R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, aryl and benzyl; and n is 1 or 2; and pharmaceutically acid addition salts thereof.

5,486,612

N-BENZYL DIHYDROINDOLE LTD_4 ANTAGONISTS

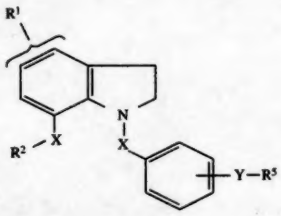
J. Scott Sawyer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 14, 1993, Ser. No. 166,489

Int. Cl.[6] C07D *401/14;* A61K *31/475*

U.S. Cl. 546—176 **6 Claims**

1. A compound represented by the formula (II) and pharmaceutically acceptable salts thereof:



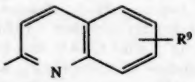
(II)

wherein;

R^1 is selected from the group consisting of hydrogen, halo, C_{1-4} alkyl, C_{1-4} alkoxy, nitrile, optionally protected carboxy, C_{1-4} alkoxy-carbonyl and trihalomethyl;

R^2 is tetrazolyl, nitrile, carboxy, C_{1-4} alkoxycarbonyl or $-CONR^7R^8$ where R^7 and R^8 are each hydrogen or C_{1-4} alkyl;

R^5 is



where R^9 is hydrogen, halo, C_{1-4} alkyl, C_{1-4} alkoxy or trihalomethyl;

each X is independently selected from a bond, $-(CH_2)_n-$ where n is from 1 to 5, $-O-CR^{11}R^{12}-$, $-CR^{11}R^{12}-CR^{13}R^{14}-$ or $-CR^{11}=CR^{12}-$ where R^{11},R^{12}, R^{13} and R^{14} are each hydrogen or C_{1-4} alkyl; and

Y is $-O-CR^{15}R^{16}-$ or $-CR^{15}=CR^{16}-$ where R^{15} and R^{16} are each hydrogen or C_{1-4} alkyl.

5,486,613

VULCANIZATION ACCELERATORS

Fabio Broussard, Brusaporto; Mauro Adovasio, Bergamo; Corrado Callierotti, Seriate; Gianbattista Taroni, Mozzo, and José Roncalli, Bergamo, all of, Italy, assignors to Great Lakes Chemical Italia S.r.l., Milan, Italy

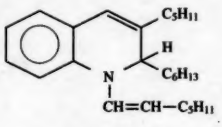
Filed Jul. 11, 1994, Ser. No. 272,826

Claims priority, application Italy, Jul. 15, 1993, MI93A1566; Apr. 7, 1994, MI94A0650

Int. Cl.[6] C07D *215/06*

U.S. Cl. 546—181 **1 Claim**

1. A novel vulcanization accelerator compound, the compound having the formula (III):



(III)

5,486,614

INTERMEDIATES FOR PEPARING ANTIFOLATE COMPOUNDS

Charles J. Barnett, Indianapolis, and Thomas M. Wilson, Speedway, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

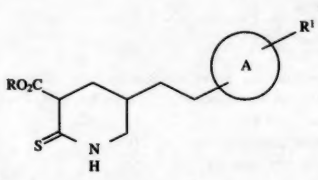
Division of Ser. No. 96,099, Jul. 23, 1993, which is a continuation-in-part of Ser. No. 961,572, Oct. 15, 1992, abandoned. This application May 30, 1995, Ser. No. 453,529

Int. Cl.[6] C07D *211/78;405/06;409/06*

U.S. Cl. 546—207 **10 Claims**

1. A compound of formula II

formula II



wherein

R is C_1–C_4 alkyl or phenyl which may be substituted;

R^1 is bromo, iodo or $COOR^2$;

R^2 is H, C_1–C_4 alkyl, phenyl which may be substituted or benzyl; and

Ⓐ is an aryl group which may be substituted; or a salt thereof.

5,486,615

METHOD OF MAKING ASYMMETRIC DE RING INTERMEDIATES FOR THE SYNTHESIS OF CAMPTOTHECIN ANALOGS

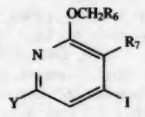
Daniel L. Comins, Cary, N.C., assignor to North Carolina State University, Raleigh, N.C.

Division of Ser. No. 159,117, Nov. 30, 1993, Pat. No. 5,395,939. This application Aug. 10, 1994, Ser. No. 288,591

Int. Cl.[6] C07D *213/61;213/64*

U.S. Cl. 546—301 **7 Claims**

1. A compound of Formula VII:



VII

wherein Y is H or halogen, R_6 is lower alkoxy, and R_7 is lower hydroxy-alkyl.

5,486,616

METHOD FOR LABELING AND DETECTING MATERIALS EMPLOYING ARYLSULFONATE CYANINE DYES

Alan S. Waggoner; Lauren A. Ernst, both of Pittsburgh, and Ratnakar B. Mujumdar, Glenshaw, all of Pa., assignors to Carnegie Mellon University, Pittsburgh, Pa.

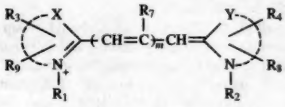
Division of Ser. No. 884,636, May 15, 1992, Pat. No. 5,268,486, which is a continuation of Ser. No. 240,756, Sep. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 854,347, Apr. 18, 1986, abandoned. This application Nov. 29, 1993, Ser. No. 158,952

Int. Cl.[6] C07D *413/06*

U.S. Cl. 548—217 **9 Claims**

1. A water soluble luminescent dye consisting of:

a cyanine having the structure



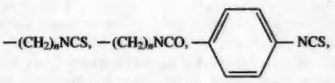
wherein:

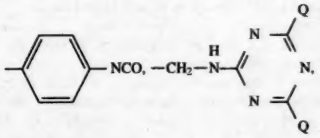
the dotted lines each represent carbon atoms necessary for the formation of one ring to three fused rings having 5 to 6 atoms in each ring and said R_3, R_4, R_8 and R_9 groups are attached to said rings;

at least one of X and Y is oxygen and the other is selected from the group consisting of O, S and $CH_3—C—CH_3$;

m is an integer selected from the grouping consisting of 1, 2 and 3;

at least one of said R_1, R_2, R_3, R_4 and R_7 groups reacts with amino, hydroxy or sulfhydryl nucleophiles and is a reactive moiety selected from the group consisting of





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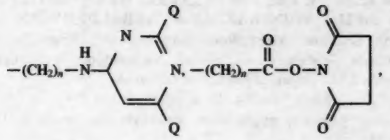
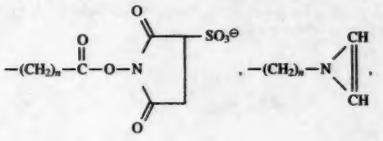
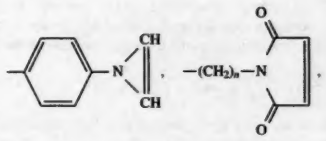
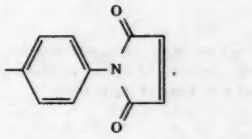
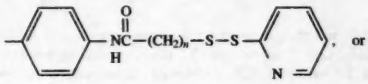


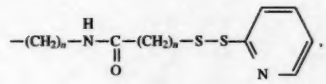








or



wherein Q is Br or Cl, and n=0, 1, 2, 3, 4, 5, 6, 7 or 8 for R_3, R_4 and R_7, and n=1, 2, 3, 4, 5, 6, 7 or 8 for R_1 and R_2;

and when any one of said R_3, R_4, and R_7 groups is not selected from one said reactive moiety, said remaining R_3, R_4, and R_7 are hydrogen or E—F, a polar group wherein E is a spacer group having the structure $—(CH_2)_n—$ and n of said spacer group=0, 1, 2, 3, or 4, and F is hydroxy, sulfonate, sulfate, carboxylate, or a lower alkyl substituted amino;

and when any one of said R_1 and R_2 groups is not selected from one said reactive moiety, said remaining R_1 or R_2 are a lower alkyl or said E—F and n of said spacer group=1, 2, 3, or 4;

at least one said R_8 and R_9 groups is selected from the group consisting of a sulfonic acid and sulfonate moiety attached directly to one of said one ring to three fused rings for conferring luminescence to said dye, wherein said ring or rings to which said sulfonic acid or sulfonate moiety is attached is an aryl ring;

and when one of said R_8 or R_9 group is not a sulfonic acid or sulfonate, said remaining R_8 or R_9 group is a hydrogen.

5,486,617

PROCESS FOR THE PREPARATION OF 2-SUBSTITUTED 5-CHLOROIMIDAZOLE-4-CARBALDEHYDES

Gareth Griffiths, Visp; René Imwinkelried, Brig-Glis, and Jacques Gosteli, Basel, all of, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

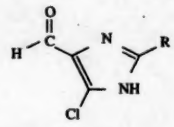
Filed Nov. 14, 1994, Ser. No. 340,377

Claims priority, application Switzerland, Nov. 15, 1993, 3410/93

Int. Cl.[6] C07D 233/68

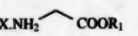
U.S. Cl. 548—333.5 12 Claims

1. A process for preparing a 2-substituted 5-chloroimidazole-4-carbaldehyde of the formula:



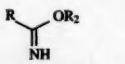
I

wherein R is hydrogen, an alkyl group, an alkenyl group, a cycloalkyl group, an arylalkyl group or an aryl group, comprising: in a first stage, reacting a glycine ester hydrohalide of the formula:



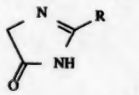
II

wherein R_1 is an alkyl group and X is a halogen atom, with an imidate ester of the formula:



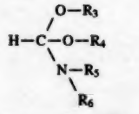
III

wherein R has the above-mentioned meaning, and R_2 is an alkyl group, in the presence of a base to obtain a 2-substituted 3,5-dihydroimidazole-4-one of the formula:



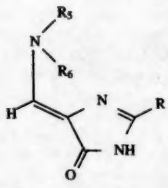
IV

wherein R has the above-mentioned meaning, in a second stage, converting said 2-substituted 3,5-dihydroimidazol-4-one of the formula IV with an N,N-substituted formamide acetal of the formula:



V

wherein R_3 and R_4 are identical or different and each is an alkyl group or an arylalkyl group, and R_5 and R_6 are identical or different and each is an alkyl group or an aryl group, to give an N,N-substituted aminomethyleneimidazolinone of the formula:



VI

wherein R, R_5 and R_6 have the above-mentioned meanings, and, finally in the third stage, the N,N-substituted aminomethyleneimidazolinone of the formula VI is chlorinated with phosphorus oxychloride or phosgene to give the final product, namely, the 2-substituted 5-chloroimidazole-4-carbaldehyde of the formula I.

5,486,618

SUBSTITUTED 5-AMINOPYRAZOLES

Helmut Hagen, Frankenthal; Gerhard Nilz, Dannstadt-Schauerheim; Helmut Walter, Obrigheim, and Andreas Landes, Limburgerhof, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigsharen, Germany

PCT No. PCT/EP91/02286, § 371 Date Jun. 7, 1993, § 102(e) Date Jun. 7, 1993, PCT Pub. No. WO92/10480, PCT Pub. Date Jun. 25, 1992

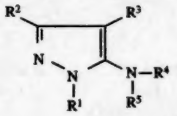
PCT Filed Dec. 3, 1991, Ser. No. 70,386

Claims priority, application Germany, Dec. 13, 1990, 40 39 733.5

Int. Cl.[6] C07D 231/00

U.S. Cl. 548—362.1 10 Claims

1. A substituted 5-aminopyrazole of the formula I



I

where

R^1 is C_1–C_8-alkyl, C_1–C_8-hydroxyalkyl or a phenyl group which may carry from one to three of the following radicals: halogen, nitro, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, partially or completely halogenated C_1–C_4-alkoxy, C_1–C_4-alkylthio or —NR^6R^7, where R^6 and R^7 are each hydrogen or C_1–C_4-alkyl, and the phenyl group may additionally carry a number of halogen atoms so that the total number of radicals is 4 or 5;

R^2 is hydrogen or C_1–C_4-alkyl which may be unsubstituted or partially or completely halogenated;

R^3 is cyano or CO—R^8 or CS—R^8, where R^8 is hydroxyl, C_1–C_4-alkoxy, amino, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino;

R^4 and R^5 are each hydrogen, C_1–C_4-alkyl, $PX(OR^9)_2$, SO_2—R^9, CX—R^{10}, CX—NH—CY—R^9 or CX—NH—SO_2—R^{11}, where X and Y are each oxygen or sulfur;

R^9 is one of the substituents R^1;

R^{10} is C_1–C_{20}-alkyl, C_1–C_4-alkoxy or a phenyl group which may carry from one to three of the following radicals: halogen, nitro, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, partially or completely halogenated C_1–C_4-alkoxy, C_1–C_4-alkylthio or —NR^6R^7, and which may additionally carry a further number of halogen atoms so that the total number of radicals is 5; amino which may be unsubstituted or may carry a C_1–C_4-alkyl, cycloalkyl or phenyl radical, where the phenyl radical may additionally carry from one to three of the following radicals: halogen, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, partially or completely halogenated C_1–C_4-alkoxy or C_1–C_4-alkylthio, and the phenyl group may additionally contain a further number of halogen atoms so that the total number of radicals is 4 or 5;

R^{11} is amino, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, pyrrolidinyl, piperidinyl or morpholinyl;

or

R^4 and R^5 together form a group $=CR^{12}R^{13}$ or —CO—W—CO—, where R^{12} is hydrogen, amino, C_1–C_4-alkylamino or C_3—C_8-cycloalkylamino;

R^{13} is amino, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, C_3–C_8-cycloalkylamino, pyrrolidin-1-yl, piperidin-1-yl, morpholin-4-yl, phenyl or pyridyl, where the two last-mentioned substituents may furthermore carry from one to three of the following radicals: halogen, nitro, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, partially or completely halogenated C_1–C_4-alkoxy or C_1–C_4-alkylthio;

W is an ethylene or ethenylene bridge, a 5-membered or 6-membered 1,2-C-bonded aromatic or heteroaromatic bridge having a nitrogen, oxygen or sulfur atom as the hetero atom, where these bridge members may furthermore carry, on each substitutable carbon atom, a radical selected from up to 2 of the following: halogen, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, partially or completely halogenated C_1–C_4-alkoxy, C_1–C_4-alkylthio and partially or

completely halogenated C_1–C_4-alkylthio, and where the bridge members may additionally carry a number of halogen atoms equivalent to the number of further substitutable carbon atoms, or

a 5-membered or 6-membered 1,2-C-bonded cycloalkylene or cycloalkenylene bridge, where these substituents may furthermore carry from one to four of the following radicals: halogen or C_1–C_4-alkyl;

and the basic salts of the compounds I in which R^3 is hydroxycarbonyl or hydroxythiocarbonyl, and the acidic salts of the compounds I which contain a basic nitrogen atom,

with the exception of 1-phenyl- and 1-methyl-4-cyano-5-acylaminopyrazole, 1-methyl-4-cyano-5-(chloromethylcarbonylamino)-pyrazole, 1-methyl-4-cyano-5-(phenylcarbonylamino)-pyrazole, 1-methyl-4-cyano-5-(p-chlorophenylcarbonylamino)-pyrazole, 5-amino-4-cyano-1-methylpyrazole, 5-amino-4-cyano-1,3-dimethylpyrazole, 5-amino- 4-cyano-1-methyl-3-trifluoromethylpyrazole, 5-amino-1,3 -dimethylpyrazole-4-carboxamide, 5-amino-1-methylpyrazole- 4-carboxamide, 5-amino-1-(2-hydroxyethyl)-pyrazole-4-carboxamide, 5-amino-4-cyano-1-(2-hydroxyethyl)-pyrazole and those compounds I in which either

R^1 is unsubstituted or substituted phenyl and R^4 and R^5 are simultaneously hydrogen or

R^1 is unsubstituted or substituted phenyl, R^2 and R^5 are each hydrogen, R^3 is cyano and R^4 is hydrogen or C_1–C_4-alkylamino or

R^1 is substituted phenyl, R^2 and R^5 are each hydrogen,

R^3 is cyano, C_1–C_4-alkoxycarbonyl, aminocarbonyl or C_1–C_4-alkylaminocarbonyl and R^4 is CX—(C_1–C_4-alkoxy), or substituted or unsubstituted CX—NH_2, and

with the exception of those compounds I in which one of the radicals R^4 or R^5 is C_1–C_3-alkyl and the other is methoxycarbonyl or ethoxycarbonyl when R^2 is hydrogen, R^3 is cyano and R^1 is substituted phenyl.

5,486,619

METHOD OF PRODUCING DAI FROM DOPA, USING ONE REACTION VESSEL

Gottfried Wenke, Woodbridge; Yuh-Guo Pan, Stamford; Mu-Ill Lim, Trumbull, and Linas Stasaitis, Fairfield, all of Conn., assignors to Clairol, Inc., New York, N.Y.

Filed Apr. 29, 1994, Ser. No. 235,763

Int. Cl.[6] C07D *209/08*

U.S. Cl. 548—508 **20 Claims**

1. A method of producing and isolating 5,6-diacetoxyindole in a single reaction vessel comprising the following steps:

(a) preparing a first solution comprising dopa, water and a solubilizing agent selected from the group consisting of an acid having a pk_a value equal to or less than 4 and a first base having a pk_b value equal to or greater than 10;

(b) preparing a second solution comprising an oxidant, a buffer and water;

(c) mixing the first and second solutions to form a combined solution which is rendered oxygen-free and has a pH of from about 6 to about 9;

(d) stirring said combined solution in an inert atmosphere until 5,6-dihydroxyindole is substantially completely formed;

(e) adding a derivatizing agent and a second base to said combined solution to form a final solution, wherein said derivatizing agent is present in an amount to derivatize substantially all of said 5,6-dihydroxyindole;

(f) stirring said final solution until said 5,6-dihydroxyindole is substantially fully consumed;

(g) cooling said final solution to precipitate 5,6-diacetoxyindole;

(h) isolating the precipitated 5,6-diacetoxyindole.

5,486,620

INTERMEDIATES FOR THE SYNTHESIS OF KAINIC ACID

James A. Monn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

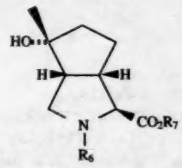
Division of Ser. No. 56,687, Apr. 30, 1993, Pat. No. 5,352,799, which is a continuation-in-part of Ser. No. 985,986, Dec. 4, 1992, Pat. No. 5,319,095. This application Apr. 22, 1994, Ser. No. 231,543

Int. Cl.[6] C07D *513/16*

U.S. Cl. 548—515 **10 Claims**

1. A compound off the formula

III



wherein

R_6 is hydrogen, acyl, alkoxycarbonyl, or arylalkoxycarbonyl; and

R_7, is hydrogen, C_1–C_6 alkyl, aryl, or arylalkyl.

5,486,621

FUNGICIDES FOR THE CONTROL OF TAKE-ALL DISEASE OF PLANTS

Dennis Phillion, St. Charles; Sai C. Wong, Chesterfield, and Barry Shortt, New Melle, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 15, 1994, Ser. No. 356,770

Int. Cl.[6] C07D *333/72;* **A01N** *43/10*

U.S. Cl. 549—4 **7 Claims**

1. A compound which is 4,5-dimethyl-N-2-propenyl-2-trimethylsilyl)-3-thiophenecarboxamide.

5,486,622

PROCESS AND INTERMEDIATE PRODUCTS FOR THE PRODUCTION OF 5-OXASPIRO [2.4] HEPTAN-6-ONE

Paul Hanselmann, Visp, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

Filed Apr. 5, 1995, Ser. No. 417,250

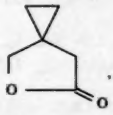
Claims priority, application Switzerland, Apr. 21, 1994, 1230/94

Int. Cl.[6] C07D *307/94;307/26;* **C07C** *255/00*

U.S. Cl. 549—265 **8 Claims**

1. A process for the production of 5-oxaspiro[2.4]heptan-6-one of formula:

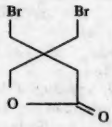
I



comprising converting [3-(hydroxymethyl)oxetan-3-yl]acetonitrile of formula:

II

with hydrogen bromide to 4,4-bis(bromomethyl)dihydro-2-furanone of formula:



III

and cyclizing the 4,4-bis(bromoethyl)dihydro-2-furanone of formula III with zinc to the 5-oxaspiro[2.4]heptan-6-one of formula I.

5,486,623

CYSTEINE PROTEASE INHIBITORS CONTAINING HETEROCYCLIC LEAVING GROUPS

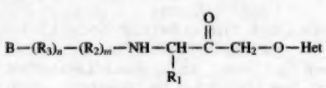
Mary P. Zimmerman, Pleasonton, and Robert E. Smith, Livermore, both of Calif., assignors to Prototek, Inc., Dublin, Calif.

Filed Dec. 8, 1993, Ser. No. 164,031

Int. Cl.[6] C07D *315/00;307/02;207/00;* **A61K** *31/35*

U.S. Cl. 549—417 **11 Claims**

1. Cathepsin inhibitors of the formula:



wherein

B is H or an amino acid blocking group for an N-terminal amino acid nitrogen;

R_1 is the amino acid side chain of the P_1 amino acid residue;

R_2 is the amino acid residue of the P_2 amino acid;

R_3 is the amino acid residue of the P_3 amino acid;

n is 0 or 1;

m is 0 or 1; and

Het is a pyrone.

5,486,624

KOJIC ACID DERIVATIVE

Chang M. Yang, Seongnam; Jong Y. Hong; Ki W. Lee, both of Seoul; Byeong G. Lee, Suwon, and Dong I. Chang, Anyang, all of, Rep. of Korea, assignors to Pacific Corporation, Seoul, Rep. of Korea

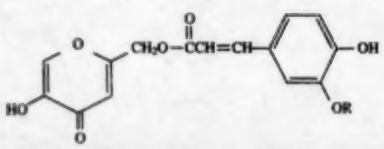
Filed Jan. 19, 1995, Ser. No. 374,914

Claims priority, application Rep. of Korea, Feb. 1, 1994, 1994-1795

Int. Cl.[6] C07D *309/40*

U.S. Cl. 549—418 **1 Claim**

1. A kojic acid derivative represented by the formula (I):



(I)

wherein, R is a hydrogen atom or methyl group.

5,486,625

PROCESS FOR THE PREPARATION OF CHIRAL INTERMEDIATES USEFUL FOR THE SYNTHESIS OF ANTIFUNGAL AGENTS

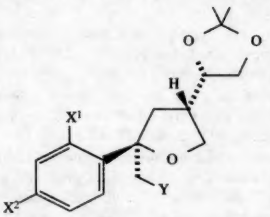
William Leong, Westfield, and Lyman H. Smith, Piscataway, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jul. 8, 1994, Ser. No. 272,411

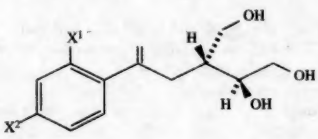
Int. Cl.[6] C07D *317/00;249/08;233/04*

U.S. Cl. 549—448 **17 Claims**

1. A process for preparing chiral compounds of the formula

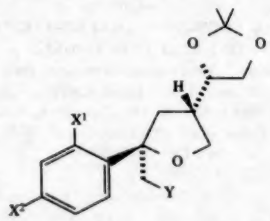


wherein X^1 and X^2 are independently F or Cl, and Y is Cl, Br or I, comprising reacting a triol of the formula



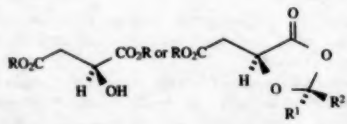
wherein X^1 and X^2 are as defined above, with acetone in the presence of a catalyst, then with a halogen selected from Cl_2, Br_2 or I_2, or N-bromosuccinimide or N-iodosuccinimide.

6. A process for preparing chiral compounds of the formula



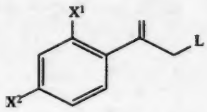
wherein X^1 and X^2 are independently F or Cl, and Y is Cl, Br or I, comprising the steps:

(a) using a nonaqueous base to deprotonate a chiral compound of the formula

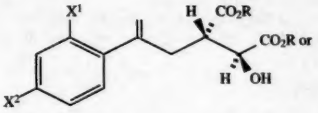


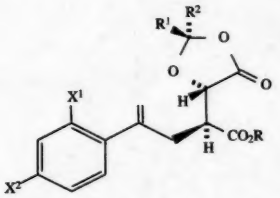
wherein: R is C_1-C_6 alkyl;

one of R^1 or R^2 is H and the other is —$C(CH_3)_3$ or —CCl_3, or R^1 and R^2 are both C_1-C_6 alkyl, or R^1 and R^2 together with the carbon to which they are attached comprise a 6-membered carbocyclic ring, then treating with a compound of the formula



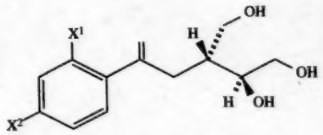
wherein X^1 and X^2 are as defined above and L is a leaving group, to form a chiral compound of the formula





respectively, wherein X^1, X^2, R, R^1 and R^2 are as defined above;

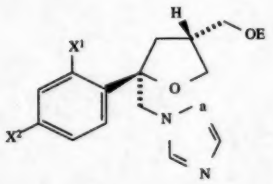
(b) reducing the product of step (a) with a hydride reducing agent to form a chiral triol of the formula



wherein X^1 and X^2 are as defined above; and

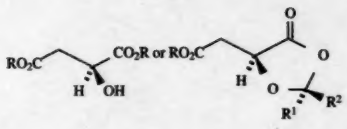
(c) reacting the triol of step (b) with acetone in the presence of a catalyst, then with a halogen selected from Cl_2, Br_2 or I_2, or N-bromosuccinimide or N-iodosuccinimide.

8. A process for preparing a compound of the formula



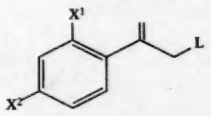
wherein: a is CH or N; X^1 and X^2 are independently F or Cl; and E is $—SO_2R^6$, wherein R^6 is C_1-C_6 alkyl, CF_3, aryl, or substituted aryl, wherein said substituted aryl is an aryl group having 1 to 3 substituents selected from halogeno, C_1-C_6 alkyl, NO_2 and CF_3, comprising the steps:

(a) using a nonaqueous base to deprotonate a chiral compound of the formula

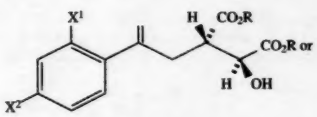


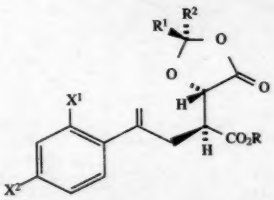
wherein: R is C_1-C_6 alkyl;

one of R^1 or R^2 is H and the other is $—C(CH_3)_3$ or $—CCl_3$, or R^1 and R^2 are both C_1-C_6 alkyl, or R^1 and R^2 together with the carbon to which they are attached comprise a 6-membered carbocyclic ring, then treating with a compound of the formula



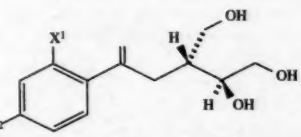
wherein X^1 and X^2 are as defined above and L is a leaving group, to form a chiral compound of the formula





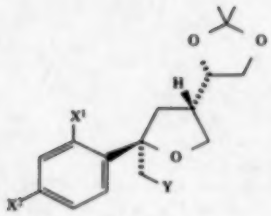
respectively, wherein X^1, X^2, R, R^1 and R^2 are as defined above;

(b) reducing the product of step (a) with a hydride reducing agent to form a chiral triol of the formula



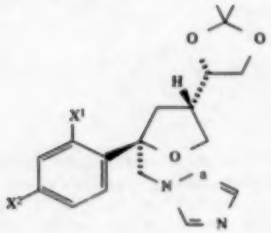
wherein X^1 and X^2 are as defined above;

(c) reacting the triol of step (b) with acetone in the presence of a catalyst, then with a halogen selected from Cl_2, Br_2 or I_2, or N-bromosuccinimide or N-iodosuccinimide, to form a chiral tetrahydrofuran of formula



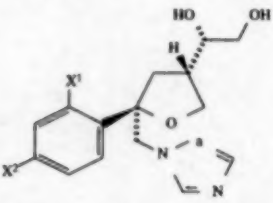
wherein X^1 and X^2 are as defined above and Y is Cl, Br or I;

(d) treating the tetrahydrofuran of step (c) with an alkali metal triazole or imidazole to form a chiral triazole or imidazole compound of the formula

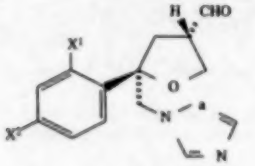


wherein a, X^1 and X^2 are as defined above;

(e) hydrolyzing the triazole or imidazole product of step(d) with an aqueous acid to form a diol intermediate of the formula

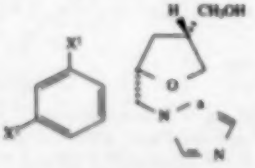


followed by oxidatively cleaving the diol using H_5IO_6, $NaIO_4$ or $Pb(OAc)_4$ to form an aldehyde of the formula



wherein a, X^1 and X^2 are as defined above;

(f) reducing the aldehyde of step (e) with a hydride reducing agent to form an alcohol of the formula



wherein a, X^1 and X^2 are as defined above; and

(g) treating the alcohol of step (f) with a compound of the formula E-X, wherein X is Cl or Br, and E is as defined above.

5,486,626

PROCESS FOR THE PREPARATION OF 3β-AMINOCHOLANIC ACID DERIVATIVES

Alfons Enhsen, Büttelborn; Heiner Glombik, Hofheim/Ts.; Werner Kramer, Mainz, and Günther Wess, Erlensee, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

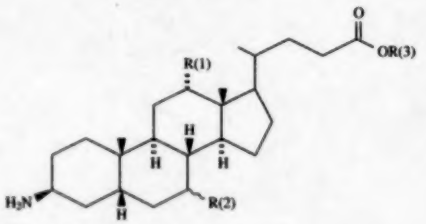
Filed Mar. 7, 1994, Ser. No. 206,321

Claims priority, application Germany, Mar. 9, 1993, 43 07 305.0

Int. Cl.[6] C07J *41/00*

U.S. Cl. 552—521 **4 Claims**

1. A process for the preparation of a 3β-aminocholanic acid derivative of the formula II



II

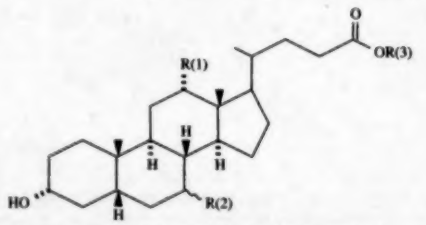
in which R(1) is H or OH,

R(2) is H, α-OH or β-OH

and R(3) is an unbranched C_1–C_4-alkyl radical or a branched C_3–C_4-alkyl or a benzyl radical,

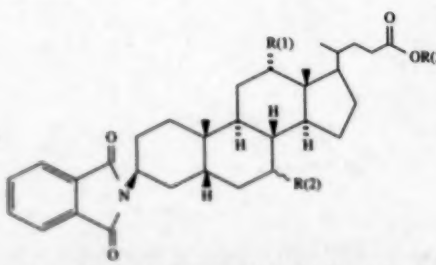
and of a salt thereof with a mineral acid, which comprises

a) reacting a 3α-hydroxycholanic acid ester of the formula III



III

with phthalimide to give the 3β-phthalimido derivative of the formula IV



IV

b) reacting a resulting 3β-phthalimidocholanic acid ester of the formula IV with hydrazine hydrate or phenylhydrazine and

c) splitting the phthalimide group by treating the reaction product with an aqueous solution of a mineral acid, an acid addition salt of the compound II with the mineral acid being formed.

5,486,627

METHOD FOR PRODUCING EPOXIDES

George J. Quarderer, Jr., Midland, Mich.; Curtis N. Swisher, and David L. Trent, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 2, 1994, Ser. No. 348,639
Int. Cl.[6] C07D *301/26;303/04;303/08;303/14*
U.S. Cl. 549—521 32 Claims

1. A method for producing epoxides comprising the steps:

(a) forming a low chlorides aqueous hypochlorous acid solution;

(b) contacting the low chlorides aqueous hypochlorous acid solution with at least one unsaturated organic compound to form an aqueous organic product comprising at least olefin chlorohydrin, wherein the unsaturated organic compound contains from 2 to about 10 carbon atoms and is selected from the group consisting of substituted and unsubstituted olefins and cyclic olefins, the substituted olefins having substituents selected from the group consisting of an alkyl radical, a phenyl radical, and an alkylphenyl radical, each radical being independently either unsubstituted or substituted;

(c) contacting at least the olefin chlorohydrin with an aqueous alkali metal hydroxide to form an aqueous salt solution product containing at least epoxide; and

(d) isolating the epoxide from the aqueous salt solution;

wherein water is recovered from the product of at least Step (b) and recycled into Step (a) for use in forming the low chlorides aqueous hypochlorous acid solution.

5,486,628

ETHYLENE OXIDE CATALYST AND PROCESS

Richard A. Kemp, 11510 Chariot, Stafford, Tex. 77477

Division of Ser. No. 64,287, May 17, 1993, Pat. No. 5,447,897. This application May 23, 1995, Ser. No. 448,149
Int. Cl.[6] C07D *301/10;303/04*
U.S. Cl. 549—536 6 Claims

1. In a process for the production of ethylene oxide wherein ethylene is contacted in the vapor phase with an oxygen-containing gas at ethylene oxide forming conditions at a temperature in the range of from about 180° C. to about 330° C. in the presence of a silver metal-containing catalyst, the improvement which comprises using a catalyst comprising a catalytically effective amount of silver, a promoting amount of alkali metal, a promoting amount of a rare earth metal compound and a promoting amount of rhenium supported on a suitable support having a surface area in the range of from about 0.05 m^2/g to about 10 m^2/g.

5,486,629

DIRECT DYES HAVING A QUATERNARY CENTER WITH A LONG ALIPHATIC CHAIN

Alexander Chan, Mineola, N.Y., and Yuh-Guo Pan, Stamford, Conn., assignors to Clairol, Inc., New York, N.Y.

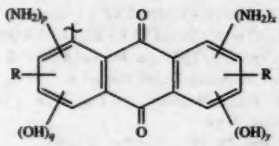
Division of Ser. No. 179,289, Jan. 10, 1994, Pat. No. 5,360,930, which is a division of Ser. No. 939,202, Sep. 1, 1992, Pat. No. 5,314,505. This application Jul. 28, 1994, Ser. No. 281,818
Int. Cl.[6] C09B *1/16*
U.S. Cl. 552—236 1 Claim

1. An aminoanthraquinone dye compound of the formula (I):

$$Q\text{-}NR_6(CH_2)_n\text{-}N^+R_1R_2R_3\ X^-$$

or a cosmetically acceptable salt thereof, wherein

Q is an anthraquinone of the formula (V):



(V)

n is 2 to 12;

p, q, x, and y are, independent of each other, 0, 1, or 2;

R is hydrogen, C_{1-6} alkyl, C_{1-6} hydroxyalkyl, C_{1-6} polyhydroxyalkyl, halogen, C_{1-6} alkoxy, halogenated C_{1-3} alkyl, polyhalogenated C_{1-3} alkyl, CN, amide, or COOH;

R_1 is C_{1-6} alkyl, C_{1-6} hydroxyalkyl, or C_{1-6} polyhydroxyalkyl;

R_2 is C_{1-6} alkyl, C_{1-6} hydroxyalkyl, or C_{1-6} polyhydroxyalkyl;

R_3 is a C_{8-22} aliphatic chain;

R_6 is hydrogen, C_{1-6} alkyl, C_{1-6} hydroxyalkyl, or C_{1-6} polyhydroxyalkyl; and

X^- is a monovalent or divalent anion.

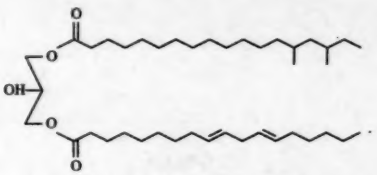
5,486,630

LEGIONELLA SPECIFIC ANTIBIOTIC

Yong W. Lee, Seoul; Yeong S. Lee, Goyang; Chang S. Yon, Seoul; Jung W. Suh, Inchun; Chul H. Lee, Seoul; Yoong H. Lim, Anyang, and Ick D. Yoo, Daejeon, all of, Rep. of Korea, assignors to Cheil Foods & Chemicals Inc., Seoul, and Korea Institute of Science and Technology, Sungbuk-ku, both of, Rep. of Korea

Filed Nov. 14, 1994, Ser. No. 340,358
Claims priority, application Rep. of Korea, Sep. 14, 1994, 94-23582; Sep. 14, 1994, 94-23583; Sep. 14, 1994, 94-23584
Int. Cl.[6] C07C *59/00;* A01N *37/06;* C12P *7/02;* A61K *39/02*
U.S. Cl. 554—1 1 Claim

1. A compound of the formula:



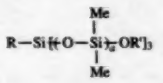
5,486,631

SILICONE POLYMERS FOR THE MODIFICATION OF ZINC OXIDE

Mark Mitchnick, Hampton, N.Y., and Anthony J. O'Lenick, Jr., Lilburn, Ga., assignors to Siltech Inc., Norcross, Ga., and Sunsmart Inc., Wainscott, N.Y.

Filed Jun. 14, 1995, Ser. No. 490,494
Int. Cl.[6] C07F *3/06*
U.S. Cl. 556—10 18 Claims

1. A hydrophobic zinc oxide which is prepared by the reaction of a silicone compound conforming to the following structure:



Me is methyl;

R is alkyl having one to ten carbon atoms;

R' is methyl or ethyl;

a is an integer ranging from 4 to 12;

with zinc oxide.

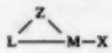
5,486,632

GROUP 4 METAL DIENE COMPLEXES AND ADDITION POLYMERIZATION CATALYSTS THEREFROM

David D. Devore; Francis J. Timmers, both of Midland, Mich.; James C. Stevens, Richmond, and Robert K. Rosen, Sugar Land, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 28, 1994, Ser. No. 267,993
Int. Cl.[6] C08F 4/643;4/642
U.S. Cl. 556—11 10 Claims

1. A metal complex containing one and only one cyclic, delocalized, anionic, π-bonded group, said complexes corresponding to the formula:



wherein:

M is a Group 4 metal in the +4 formal oxidation state;

L is a group containing a cyclic, delocalized, anionic, π-system through which the group is bound to M, and which group is also bound to Z;

Z is a moiety bound to M via a σ-bond, comprising an element selected from the group consisting of boron, and the members of Group 14 of the Periodic Table of the Elements, and also comprising an element selected from the group consisting of nitrogen, phosphorus, sulfur and oxygen, said moiety having up to 60 non-hydrogen atoms; and

X is a conjugated diene or a hydrocarbyl-, halocarbyl-, or silyl-substituted derivative thereof, said X having from 4 to 40 non-hydrogen atoms, and being coordinated to M so as to form a metallocyclopentene therewith.

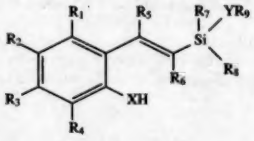
5,486,633

PHOTOCHEMICALLY-REMOVABLE SILYL PROTECTING GROUPS

Michael C. Pirrung, Houston, Tex., and Yong Rok Lee, Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Nov. 10, 1994, Ser. No. 339,216
Int. Cl.[6] C07F 7/08;7/10
U.S. Cl. 556—410 10 Claims

1. A photochemically-removable silyl protecting agent of the Formula (I):



(I)

wherein:

R_1–R_6 are, independently, hydrogen, alkyl, O-alkyl, N-alkyl, S-alkyl, aryl, heteroaryl or halogen;

R_7–R_8 are alkyl;

YR_9 is a leaving group; and

X is S, O or NH;

or salt thereof.

5,486,634

METHOD FOR THE PREPARATION OF ORGANOPOLYSILOXANES WITH SECONDARY AMINOALKYL GROUPS LINKED THROUGH A CARBON ATOM TO A SILICON ATOM

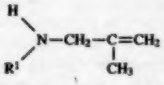
Günter Hahn; Klaus-Dieter Klein, both of Mülheim, and Dietmar Schäfer, Hattingen, all of, Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Filed Dec. 22, 1994, Ser. No. 362,098
Claims priority, application Germany, Dec. 23, 1993, 43 44 082.7
Int. Cl.[6] C07F 7/10
U.S. Cl. 556—425 3 Claims

1. A method for the synthesis of organopolysiloxanes having secondary aminoalkyl groups linked over carbon atoms to silicon atoms comprising the steps of

hydrosilylating secondary aminoalkenes with hydrogen siloxanes in presence of platinum catalysts and, optionally, by subsequently equilibrating under basic conditions thus obtained organo-modified organopolysiloxanes with cyclic siloxanes,

further comprising that the secondary aminoalkene has a general formula



wherein R^1 is an alkyl group having 1 to 4 carbon atoms, with the proviso that the secondary aminoalkene is linked to the silicon atoms exclusively through a γ-addition.

5,486,635

METHOD FOR PREPARING DIORGANOPOLYSILOXANE HAVING A FUNCTIONAL GROUP AT ONLY ONE END OF THE MOLECULAR CHAIN

Tadashi Okawa, Chiba, Japan, assignor to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1995, Ser. No. 428,938
Claims priority, application Japan, Apr. 28, 1994, 6-113951
Int. Cl.[6] C07F 7/08
U.S. Cl. 556—437 12 Claims

1. A method for preparing a diorganopolysiloxane of the formula

$$R((_2SiO)_pB$$

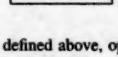
wherein R is an independently selected monovalent hydrocarbon group, B is selected from the group consisting of a hydrogen atom and an organosilyl group having the formula

$$—SiR_2R'$$

in which R is as defined above, R' is selected from the group consisting of a hydrogen atom and an organo functional group and p is an integer having a value of at least 1, said method comprising:

(1) polymerizing, in a nonequilibrium polymerization reaction,

(A) a cyclic trisiloxane having the formula



in which R is as defined above, optionally in the presence of

(B) a compound having its formula

$$R(R_2SiO_m)H$$

in which R is as defined above and m is an integer having a value of at least 1, using

(C) a lithium compound catalyst of the general formula

$R(R_2SiO)_nLi$

in which R is as defined above and n is an integer having a value of at least 0, said nonequilibrium polymerization reaction taking place in the presence of

(D) a compound selected from the group consisting of a nitrile compound and an ester compound and

(E) a polar solvent which does not contain activated hydrogen; and

(II) terminating the nonequilibrium polymerization reaction product obtained from step (I) using

(F) a compound selected from the group consisting of an acid and an organohalogenosilane of the formula

$R'R_2SiX$

in which R and R' are as defined above and X is a halogen atom.

5,486,636

SYNTHESIS OF 19-NOR VITAMIN D COMPOUNDS

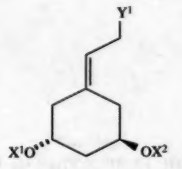
Hector F. DeLuca, Deerfield; Heinrich K. Schnoes; Kato L. Perlman, both of Madison, all of Wis., and Rolf E. Swenson, Lake Bluff, Ill., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 180,702, Jan. 13, 1994, Pat. No. 5,391,755, which is a division of Ser. No. 979,482, Nov. 20, 1992, Pat. No. 5,281,731, which is a continuation of Ser. No. 705,917, May 28, 1991, abandoned. This application Oct. 26, 1994, Ser. No. 329,334

Int. Cl.[6] C07C *35/17;35/14;43/184;* **C07F** *7/02*

U.S. Cl. 556—443 **1 Claim**

1. A compound of the structure:



where X^1 and X^2, which may be the same or different, represent hydrogen or a hydroxy-protecting group and where Y^1 represents hydroxy, protected-hydroxy, O-tosyl, O-mesyl, bromine, chlorine or iodine.

5,486,637

UNSATURATED ALCOHOLS AS ACCELERATORS FOR HYDROSILATION

Howard M. Bank, Freeland, and Gary T. Decker, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 17, 1995, Ser. No. 425,007

Int. Cl.[6] C07F *7/08;7/18*

U.S. Cl. 556—479 **22 Claims**

1. A hydrosilation process comprising: contacting

(A) a silicon hydride described by formula

$$R^1_aH_bSiX_{4-a-b}, \quad (I),$$

where each R^1 is independently selected from a group consisting of alkyls comprising one to 20 carbon atoms, cycloalkyls comprising four to 12 carbon atoms, and aryls; each X is independently selected from a group consisting of halogen and organooxy radicals described by formula —OR^1, where R^1 is as previously described, a=0 to 3, b=1 to 3, and a+b=1 to 4; and

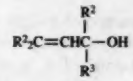
(B) an unsaturated reactant selected from a group consisting of

(i) substituted and unsubstituted unsaturated organic compounds,

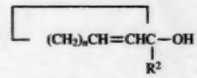
(ii) silicon compounds comprising substituted or unsubstituted unsaturated organic substituents, and

(iii) mixtures of (i) and (ii);

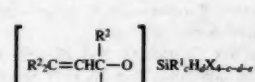
in the presence of a platinum catalyst selected from a group consisting of platinum compounds and platinum complexes, and an accelerator selected from a group consisting of unsaturated secondard and tertiary alcohols described by formulas



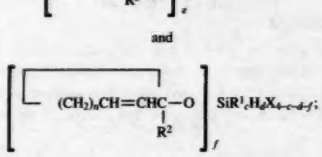
and



and silated unsaturated secondary and tertiary alcohols described by formulas



and



where each R^2 is independently selected from a group consisting of hydrogen and alkyls comprising one to six carbon atoms, each R^3 is an independently selected alkyl comprising one to six carbon atoms, c=0 to 3, d=0 to 3, c+d=0 to 3, e=1 to 4, f=1 to 4, and n=0 to 10.

5,486,638

PROCESS FOR THE PREPARATION OF 1-HALO-3-TRIALKYSILANYL-BENZENE DERIVATIVES

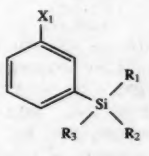
Dennis K. Klipa, and Robert T. Keaten, both of Midland, Mich., assignors to Marion Merrell Dow Inc., Cincinnati, Ohio

Filed Nov. 8, 1994, Ser. No. 336,142

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—480 **15 Claims**

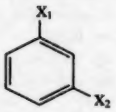
1. A process for the preparation of a compound of the formula:



wherein

X_1 is Cl Br or I; and

R_1, R_2 and R_3 are each independently C_1–C_4 alkyl, comprising adding a suitable ether to a mixture of $ClSiR_1R_2R_3$, magnesium, a suitable aromatic solvent and a compound of the formula:



wherein

X_1 and X_2 are each independently Cl Br or I and R_1, R_2 and R_3 are defined as above; provided X_2 is other than Br or Cl when X_1 is I; and further provided X_2 is other than Cl when X_1 is Br.

5,486,639

PROCESS FOR PREPARING BIS(PENTAERYTHRITOL PHOSPHATE ALCOHOL) ALKYLPHOSPHONATE

Jeffrey E. Telschow, Tarrytown, N.Y., assignor to Akzo Nobel NV, Arnhem, Netherlands

Division of Ser. No. 155,666, Nov. 22, 1993, Pat. No. 5,362,898. This application Aug. 30, 1994, Ser. No. 298,250

Int. Cl.[6] C07F *9/02*

U.S. Cl. 558—74 **3 Claims**

1. A process for preparing a bis(pentaerythritol phosphate alcohol) alkylphosphonate compound which comprises the transesterification of a diphenyl alkyl phosphonate carrying the desired alkyl group with pentaerythritol phosphate alcohol.

5,486,640

PROCESS FOR PREPARING BIS(PENTAERYTHRITOL PHOSPHATE ALCOHOL) ALKYLPHOSPHONATE

Jeffrey E. Telschow, Tarrytown, N.Y., assignor to Akzo Nobel NV, Arnhem, Netherlands

Division of Ser. No. 155,666, Nov. 22, 1993, Pat. No. 5,362,898. This application Aug. 30, 1994, Ser. No. 298,249

Int. Cl.[6] C07F *9/02*

U.S. Cl. 558—74 **3 Claims**

1. A process for preparing a bis(pentaerythritol phosphate alcohol) alkylphosphonate compound which comprises the reaction of pentaerythritol phosphate alcohol, a trialkylamine, and an alkylphosphonic dihalide.

5,486,641

SOLVENT-FREE PROCESS FOR THE PREPARATION OF THE BETA CRYSTALLINE MODIFICATION OF 2,2',2"-NITRILO[TRIETHYL-TRIS-(3,3',5,5',-TETRA-TERT-BUTYL-1,1'-BIPHENYL-2,2'-DIYL) PHOSPHITE]

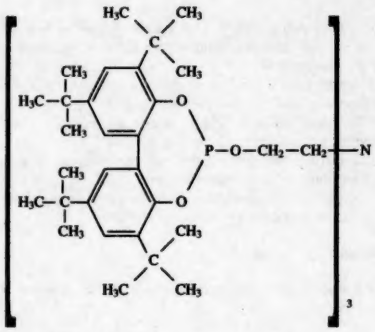
Sai P. Shum, Pleasantville, N.Y., and Stephen D. Pastor, Danbury, Conn., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Feb. 28, 1995, Ser. No. 396,315

Int. Cl.[6] C07F *9/6574*

U.S. Cl. 558—78 **4 Claims**

1. A process for the preparation of the beta, triclinic form of the compound of formula I



(I)

characterized by melting in the range of 200°–207° C. and by an X-ray diffraction pattern exhibiting lines of very high intensity at 8.4 and 17; lines of high intensity at 9.9, 10.6, 11.4, 17.5, 19.1, 20.2; lines of medium intensity at 4.6, 4.9, 7.1, 12.7, 13.2, 13.6, 15.3, 15.8, 16.4, 16.7, 18.4, 19.7, 21.7, 23.4; and lines of weak intensity at 7.8, 8.8, 9.4, 12, 14.1, 14.6, 21, 22.3, 22.8, 23.9, 24.7, 25.3, 25.5, 26.4, 27.27.7, 28.4 and a relative absolute configuration of the three stereo axes of the dibenzo[d,f][1,3,2]dioxaphosphepin rings of R*,R*,S*, which comprises

placing the compound of formula I in a closed vessel and heating the vessel at atmospheric pressure to 90°–160° C. for 10–20 minutes to convert the starting compound into a crystalline mass which is the beta, triclinic crystalline form of the compound of formula I.

5,486,642

PROCESS FOR THE PRODUCTION OF CARBONIC ACID ESTERS

Frank-Gerald Kleiner, and Robert Becker, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 24, 1995, Ser. No. 410,504

Claims priority, application Germany, Apr. 5, 1994, 44 11 668.3

Int. Cl.[6] C07C *68/00*

U.S. Cl. 558—270 **3 Claims**

1. Process for the production of carbonic acid esters (carbonates) by the reaction of carbonyl compounds of the formula (I)

in which

R denotes H, O—H, O—C_1–C_{10} alkyl or O—C_{6-C10} aryl or O-bisphenol and

X denotes H, C_1–C_{10} alkyl, C_6–C_{10} aryl, with metal ions (having a positive oxidation number) which cleave the C-X bond by oxidation and organic hydroxo compounds of the formula

R—OH (II),

in which

R denotes C_1–C_{10} alkyl and C_6–C_{30} aryl, optionally under a CO (carbon monoxide) atmosphere.

5,486,643

ISOMERIZATION OF 2-METHYL-3-BUTENENITRILE

Marc Huser, Villeurbanne, and Robert Perron, Charly, both of, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Oct. 11, 1994, Ser. No. 321,111

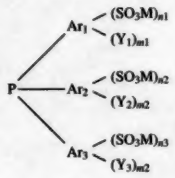
Claims priority, application France, Jan. 8, 1993, 93 12320

Int. Cl.[6] C07C 253/30

U.S. Cl. 558—355 18 Claims

1. A process for the conversion of 2-methyl-3-butenenitrile into a linear pentenenitrile, comprising isomerizing said 2-methyl-3-butenenitrile in the presence of a catalytically effective amount of an aqueous solution which comprises:

(a) at least one sulfonated phosphine of the general formula (I):



(I)

in which Ar_1, Ar_2 and Ar_3, which may be identical or different, are each an aryl radical; Y_1, Y_2 and Y_3, which may be identical or different, are each an alkyl radical having from 1 to 4 carbon atoms, an alkoxy radical having from 1 to 4 carbon atoms, a halogen atom, a CN radical, an NO_2 radical, an OH radical, or a radical NR_1R_2, in which R_1 and R_2, which may be identical or different, are each an alkyl radical having from 1 to 4 carbon atoms; M is an inorganic or organic cation selected such that the compound of formula (I) is water-soluble, from among H^+, cations derived from alkali metals or alkaline earth metals, $N(R_3R_4R_5R_6)_+$ in which R_3, R_4, R_5 and R_6, which may be identical or different are each an alkyl radical having from 1 to 4 carbon atoms, or a hydrogen atom, or other cations derived from metals, the benzenesulfonic acid salts thereof being water-soluble; m_1, m_2 and m_3 are integers, which may be identical or different, ranging from 0 to 5; and n_1, n_2 and n_3 are integers, which may be identical or different, ranging from 0 to 3, at least one of which being equal to or greater than 1; and

(b) at least one transition metal compound; to yield a product containing at least 66% by weight of a linear pentenenitrile.

5,486,644

ELECTRONIC MUSICAL INSTRUMENT HAVING A WAVEFORM MEMORY FOR STORING VARIABLE LENGTH WAVEFORM DATA

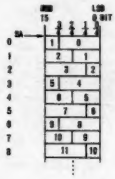
Masaki Kudo, and Kyoko Ohno, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

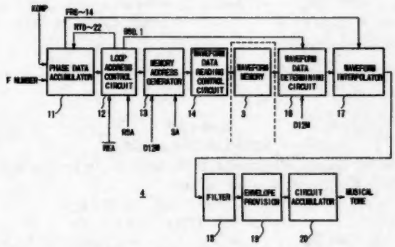
Filed Sep. 15, 1992, Ser. No. 945,025

Claims priority, application Japan, Sep. 17, 1991, 3-236542

Int. Cl.[6] G10H *7/00*

U.S. Cl. 811—604 **7 Claims**





1. An electronic musical instrument comprising:

a waveform memory for storing waveform data which is obtained by sequentially sampling musical tone waveforms, the waveform memory having a plurality of storage areas each of which is capable of storing a fixed number of bits, wherein if the length of the waveform data corresponding to a musical tone waveform is different from said fixed number of bits, the whole waveform data corresponding to the musical tone waveform is stored in the waveform memory so as not to generate vacant memory areas and the waveform data may be divided if necessary and the parts of the waveform data obtained by the division is stored in a plurality of neighboring storage areas of the waveform memory; and

musical tone generating means for generating a desired musical tone, including reading means for repetitively reading out waveform data corresponding to a portion of a waveform;

determining means for determining the waveform data from the read out data based on the length of the waveform data of the desired musical tone; and

tone generation means for generating the musical tone based on the determined waveform data.

5,486,645

MUSICAL MEDLEY FUNCTION CONTROLLING METHOD IN A TELEVISON WITH A VIDEO/ ACCOMPANIMENT-MUSIC PLAYER

Jung S. Suh, and Sang S. Lee, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

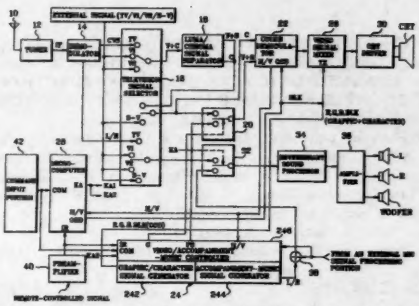
Filed Jun. 30, 1994, Ser. No. 268,942

Claims priority, application Rep. of Korea, Jun. 30, 1993, 93-12407

Int. Cl.[6] G09B *15/04;* **G10H** *1/36;* **H04N** *5/76*

U.S. Cl. 84—610 **2 Claims**

1. In a television having a karaoke player incorporated therewith, and being of the type which, upon a selection of a song, provides background video scene related to the selected song, accompaniment music associated with the selected song, and



words for display on said background, said words associated with said selected song; a method for providing a musical medley function, comprising:

actuating a medley function key;

detecting the actuation of said medley function key;

displaying on a monitor of said television a list of song themes, in response to detecting the actuation of said medley function key;

actuating a key to select one of said displayed themes;

detecting the actuation of a key corresponding to one of the displayed themes;

displaying a list of song styles associated with the selected theme;

actuating a key to select one of said displayed song styles;

detecting the actuation of a key corresponding to one of the displayed styles;

selecting from a memory of stored songs, those songs having the theme and style selected by the actuation of said keys;

playing said songs seriatim on said karaoke player by providing accompaniment music, words, and background scenes for each said song.

5,486,646

RHYTHM CREATING SYSTEM FOR CREATING A RHYTHM PATTERN FROM SPECIFYING INPUT DATA

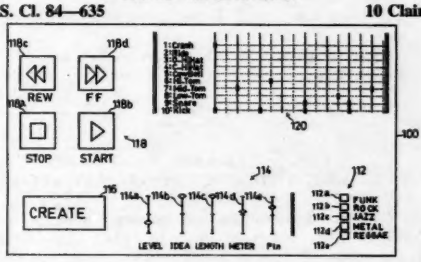
Yuji Yamashita, and Katsuhiro Toyota, both of Osaka, Japan, assignors to Roland Corporation, Osaka, Japan

Continuation of Ser. No. 942,612, Sep. 10, 1992, Pat. No. 5,369,217. This application May 26, 1994, Ser. No. 249,743

Claims priority, application Japan, Jan. 16, 1992, 4-005679; Jan. 16, 1992, 4-005680; Jan. 16, 1992, 4-005682

Int. Cl.[6] G10H *1/40;7/00*

U.S. Cl. 84—635 **10 Claims**



1. A rhythm creating system comprising:

an input means for entering a plurality of parameters specifying the genre and meter of the rhythm to be created;

a memory for storing a rule data base for associating the parameters with rhythm patterns including a LEVEL rule specifying complexity of the desired pattern, and a LENGTH rule specifying a number of bars of a rhythm pattern to be created; and

a rhythm pattern creating means for creating desired rhythm patterns by an inference system with reference to the rule data base on the basis of the plurality of parameters entered by the input means.

5,486,647

CHORD IDENTIFYING METHOD FOR AUTOMATIC ACCOMPANIMENT USING KEYBOARD INSTRUMENT AND AUTOMATIC ACCOMPANIMENT FUNCTION EQUIPPED KEYBOARD INSTRUMENT USING THE SAME

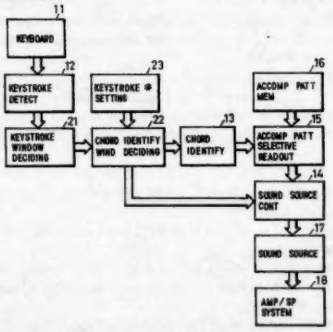
Stephen R. Kay, 140 Madison Ave., Westfield, N.J. 07090; Athan Billias, Mountain View, Calif.; Yoshiyuki Igoshi, Tokyo, and Naoki Hashida, Saitama, both of, Japan, assignors to Stephen R. Kay, Westfield, N.J., and Korg Incorporated, Suginami, Japan

Filed Jun. 24, 1994, Ser. No. 265,837

Claims priority, application Japan, Jun. 25, 1993, 5-155344

Int. Cl.[6] G10H *1/38; 1/42*

U.S. Cl. 84—635 **14 Claims**



1. A chord identifying method for automatic accompaniment wherein a chord is identified on the basis of simultaneously pressed keys of a keyboard instrument and the original chord of an accompaniment pattern read out from an accompaniment pattern memory in the course of playing said keyboard instrument is converted to said identified chord to generate an accompaniment tone signal, said method comprising the steps of:

detecting said simultaneously pressed keys of said keyboard instrument and detecting keys of the lowest and highest notes among said simultaneously pressed keys;

setting a dividing point at a center key between said keys of the lowest and highest notes;

deciding an area from said dividing point to said key of the lowest note to be used as left-hand keystroke window and an area from said dividing point to said key of the highest note as a right-hand keystroke window;

determining whether said keystroke windows are effective in the identification of chords and deciding an effective one of said keystroke windows to be used as a chord identifying window; and

identifying chords on the basis of said pressed keys in said chord identifying window.

5,486,648

POWER CABLE WITH LONGITUDINAL WATERBLOCK ELEMENTS

John C. Chan, Scarborough, and Hossein Compani, North York, both of, Canada, assignors to Alcatel Canada Wire Inc., Canada

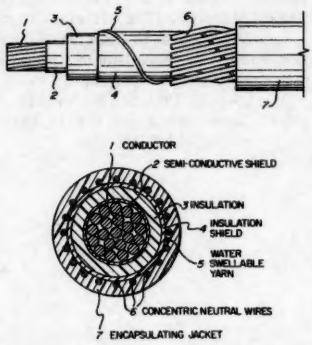
Filed Apr. 6, 1994, Ser. No. 223,639

Claims priority, application Canada, May 12, 1993, 2096066

Int. Cl.[6] H01B *7/28*

U.S. Cl. 174—23 R **29 Claims**

1. An electrical power cable having concentric neutral wires applied helically over a cable core construction extending in a longitudinal direction to provide a metallic ground shield, and having a protective polymeric jacket over said concentric neutral wires, characterized in that at least one continuous elongated water swellable element, chosen from a group consisting of yarn, yarn, filament, strand and strip, is provided in contact with the concentric



neutral wires and is so disposed in relation to said concentric neutral wires as to block passage of water within the cable in the longitudinal direction.

5,486,649

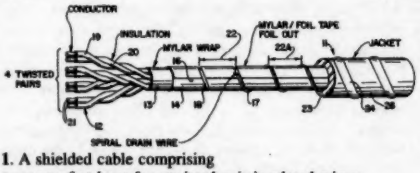
SHIELDED CABLE

Galen M. Gareis, Richmond, Ind., assignor to Belden Wire & Cable Company, Richmond, Ind.

Filed Mar. 17, 1994, Ser. No. 210,692

Int. Cl.[6] H01B *7/34*

U.S. Cl. 174—36 **18 Claims**



1. A shielded cable comprising

a group of at least four twisted pair insulated wires;

a lateral shield having overlapping longitudinal ends surrounding said group of at least four twisted-pair insulated wires, said shield having a thickness of about 1 to about 4 mils, said shield having a conductive metal foil on one surface and a non-conductive plastic on an opposite surface;

a drain wire extending the length of said cable and being in contact with said conductive metal face,

a helical groove formed in said shield; and

an insulating jacket surrounding said shield.

5,486,650

PARTITION FOR DIVIDING A DEVICE BOX

Karl Yetter, Gales Ferry, Conn., assignor to Hubbell Incorporated, Orange, Conn.

Filed Nov. 15, 1993, Ser. No. 151,916

Int. Cl.[6] H02G *3/08*

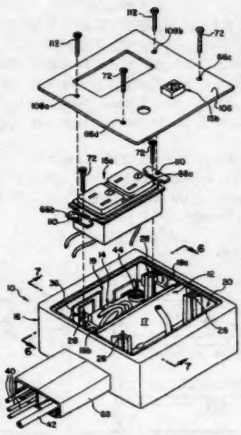
U.S. Cl. 174—53 **25 Claims**

1. A partition dimensioned to be releasably coupled to a pair of mounting posts of a device box for dividing the device box into at least two sections to separate different incoming wiring systems, said partition comprising:

a dividing member having a top edge, a bottom edge and a pair of side edges extending between said top and bottom edges;

a pair of brackets coupled to and extending outwardly from said dividing member; and

a pair of gripping members coupled to said dividing member via said brackets and configured to be releasably coupled to the pair of mounting posts of the device box for supporting said dividing member within the device box to divide the device box into said at least two sections.



5,486,651

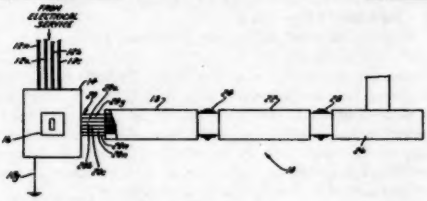
MULTI-NEURAL ELECTRICAL BUSWAY

Robert W. Morgan, Spartanburg, S.C., assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Mar. 25, 1993, Ser. No. 37,780

Int. Cl.[6] H02G *5/06*

U.S. Cl. 174—68.2 35 Claims



1. A busway system comprising:

a three-phase electrical power source including an A-phase potential, a B-phase potential, a C-phase potential and a neutral potential;

a first conductive phase busbar having a substantially rectangular cross-section of a predetermined width and a first thickness, the first conductive busbar being coupled to the A-phase of the power source;

a second conductive phase busbar having a substantially rectangular cross-section of the predetermined width and the first thickness, the second conductive busbar being coupled to the B-phase of the power source;

a third conductive phase busbar having a substantially rectangular cross-section of the predetermined width and the first thickness, the third conductive busbar being coupled to the C-phase of the power source;

at least two neutral conductive busbars for each quantity of three phase busbars in the busway system, each having a substantially rectangular cross-section of the predetermined width and second and third thicknesses, respectively, the neutral conductive busbars being coupled to the neutral potential, where the sum of the second and third thicknesses is greater than 1.5 times the first thickness; and

a busway housing having first and second ends, where the first, second and third conductive phase busbars and the at least two neutral conductive busbars are supported within the busway and extend between the first and second ends.

5,486,652

FLEXIBLE JUMPER AND METHOD OF MAKING

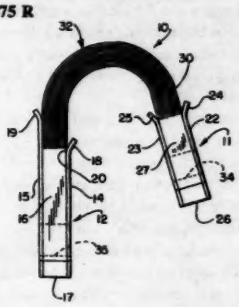
James J. Kasper, Sheffield Village, Ohio, assignor to Watteredge-Uniflex Inc., Avon Lake, Ohio

Division of Ser. No. 12,253, Feb. 1, 1993, Pat. No. 5,393,951.

This application Feb. 21, 1995, Ser. No. 391,008

Int. Cl.[6] H02G *15/02*

U.S. Cl. 174—75 R 5 Claims



1. A flexible electrical laminated jumper comprising a stack of half hard conductive metal laminations, said stack being press welded at each end of the jumper to form a substantially solid block, said laminations between said ends maintaining their half hard temper, and terminations formed in the substantially solid blocks formed by the press welded ends.

5,486,653

CRIMP-STYLE TERMINAL

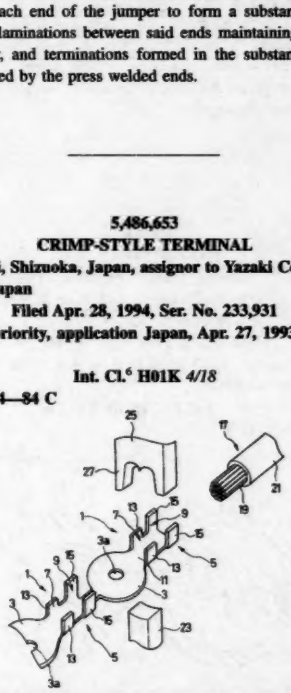
Hikoo Dohi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 233,931

Claims priority, application Japan, Apr. 27, 1993, 5-022209 U

Int. Cl.[6] H01K *4/18*

U.S. Cl. 174—84 C 12 Claims



1. A crimp-style terminal for connection with an end of an electric wire having a cross-sectional area, the terminal comprising:

an electric connecting part which is to be electrically connected to another connecting part; and

a crimping part formed integrally with said electric connecting part, said crimping part including a bottom part and a pair of bends each having a distal end protruding from both sides of said bottom part, each of said bends being formed to be thinner than said bottom part;

wherein said pair of bends being deformed in such a manner: that each distal end of said bends is directed to a substantially intermediate position in the width direction of said bottom part of the crimping part, to deform the bends with a crimping width and a crimping height conforming to the cross-sectional area of the wire arranged between said bottom part and said bends, thereby forming an electrical connection between the crimping portion and the electric wire having a substantially repeatable electrical contact resistance therebetween.

7. A method for connecting a crimp-style terminal having a crimping part to an end of an electric wire having a cross-section, comprising the steps of:

providing an electric connecting part which is to be electrically connected to another connecting part, the crimping part including a bottom part and a pair of bends protruding from both sides of said bottom part, each of said bends having a length-wise thickness which is thinner than said bottom part, each of said bends having a distal end;

positioning the electrical wire adjacent to and substantially parallel with a lengthwise extent of the bottom part; and

deforming the bends around the electrical wire and directing the distal ends of the bends to a substantially intermediate position of the electrical wire in the widthwise direction of the bottom part of the crimping part, to crimp the crimping part with a crimping width and a crimping height substantially conforming to the electrical wire cross-section, and provide an electrical connection between the terminal and the electric wire having a substantially repeatable electrical contact resistance therebetween.

5,486,654

EASY-STRIP CABLE

Karl Hanak, Fumay; Daniel Prudhon, Pierreclos; Serge Damilo, Charleville-Mezieres, and Patrick Rofidal, Fumay, all of, France, assignors to Filotex, Dravell, France

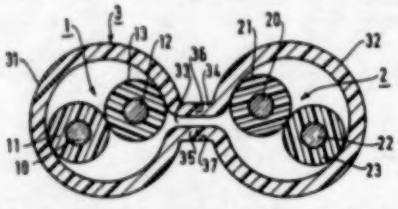
Filed Sep. 2, 1994, Ser. No. 300,206

Claims priority, application France, Sep. 6, 1993, 93 10566; Jul. 22, 1994, 94 09105

Int. Cl.[6] H01B 7/34

U.S. Cl. 174—113 R **9 Claims**

1. Easy-strip cable including individually insulated electrical



conductors assembled into separate sets and at least one continuous insulative sheath around said sets and separating said set into two groups, wherein said at least one continuous insulative sheath has two tubular portions, substantially partly open at facing locations along the cable, around said sets and separating the two groups, and two substantially parallel peripheral continuity tongues, joining the two tubular portions, delimiting between said tongues on said continuous insulative sheath a constriction whose width is less than the diameter of the insulated conductors and at least one of said tongues being rupturable for opening said continuous insulative sheath as required.

5,486,655

MULTIPLE WIRE ADHESIVE ON A MULTIPLE WIRE WIRING BOARD

Shigeharu Arike, Tochigi; Yorio Iwasaki, Shimodate; Eiichi Shinada, Shimodate; Toshiro Okamura, Shimodate; Kanji Murakami, Mito, and Yuichi Nakazato, Ibaraki, all of, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

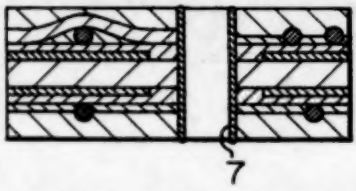
Division of Ser. No. 107,115, Aug. 17, 1993, Pat. No. 5,403,869. This application Nov. 21, 1994, Ser. No. 345,457

Claims priority, application Japan, Aug. 17, 1992, 4-217814; Jul. 2, 1993, 5-164525

Int. Cl.[6] H05K 1/02

U.S. Cl. 174—259 **2 Claims**

1. A multiple wire wiring board comprising a substrate having a



conductor circuit thereon or insulating substrate, an adhesive layer formed on one or both surfaces of the substrate, said adhesive layer being formed of an adhesive comprising

(a) an epoxy resin having a molecular weight of 5000 or more and being solid at room temperature,

(b) a polyfunctional epoxy resin having at least three epoxy groups,

(c) an intramolecular epoxy modified polybutadiene having at least three epoxy groups,

(d) a cationic photopolymerization initiator, and

(e) a tin compound,

wherein the weight ratio of (a+b+c) to (a) is 100:40 to 100:70, the weight ratio of (a+b+c) to (b) is larger than 100:10, the weight ratio of (a+b+c) to (c) is 100:10 to 100:40 and the weight ratio of (a+b+c) to (d) is 100:0.5 to 100:5 insulated encapsulated wires fixed on the adhesive layer through holes formed in necessary portions of the substrate, and conductor circuits formed on necessary portions of outmost surfaces of the substrate.

5,486,656

PRINTED CIRCUIT BOARD HAVING AN EXTRA PLATE CONNECTED TO A PRODUCT PORTION

Tatsuru Kojima, Tokyo, and Naoyuki Kohyama, Saitama, both of, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 860,320, Mar. 30, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 357,076

Claims priority, application Japan, Mar. 29, 1991, 3-027039 U

Int. Cl.[6] H01R 9/09

U.S. Cl. 174—261 **3 Claims**

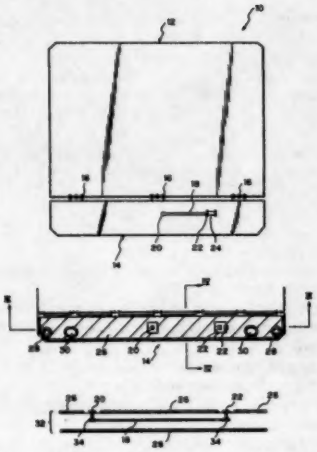
1. A laminated printed circuit board having a product portion, including a first strip conductor having a characteristic impedance and wavelength compaction ratio, and an extra plate portion connected to said product portion, said extra plate portion comprising:

a second strip conductor, provided on one of a surface and an inner layer of said laminated printed circuit board, having a characteristic impedance and wavelength compaction ratio which are substantially equal to said characteristic impedance and said wavelength compaction ratio of said first strip conductor of said product portion;

a ground conductor provided on a surface of said laminated printed circuit board;

a land for measurement formed at one end of said second strip conductor;

chip lands formed at the other end of said second strip conductor and connectable to a chip resistor;



wherein one of said chip lands is connected to said second strip conductor and another chip land is connected to said ground conductor; and

a connecting portion for connecting said extra plate portion to said product portion, wherein changes in said characteristic impedance and said wavelength compaction ratio of said product portion resulting from modifications to said laminated printed circuit board are measured via said second strip conductor without disconnecting said first strip conductor from surrounding circuitry of said product portion.

5,486,657

BEVELED EDGE CIRCUIT BOARD WITH CHANNELED CONNECTOR PADS

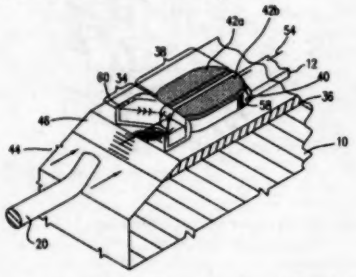
James S. Bell, Cedar Park; Patricia L. Herman, and Richard L Phillips, both of Austin, all of Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Jun. 9, 1994, Ser. No. 257,755

Int. Cl.[6] H05K *1/02*

U.S. Cl. 174—261 **16 Claims**

1. A printed circuit board, comprising:



a plurality of bonding pads spaced from each other in a row along one side of a printed circuit board, wherein said row is parallel to one edge of said printed circuit board; and

a layer of solder mask surrounding a rearward portion of said bonding pads and covering the remaining, forward portion of said bonding pads, wherein the layer of solder mask is beveled at the edge of said printed circuit board, and wherein the covered portion of each said bonding pad is arranged adjacent said beveled layer of solder mask.

5,486,658

STYLUS DEVICE FOR USE IN A SCUFFING HEAD ASSEMBLY

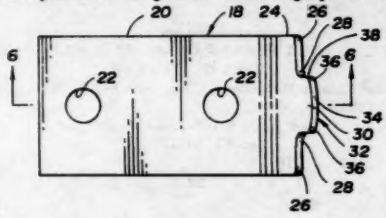
Kenneth E. Ilkka, Clinton Township, Mich., assignor to Larry Winget, Leonard, Mich.

Filed Jun. 6, 1994, Ser. No. 254,192

Int. Cl.[6] G08C *21/00*

U.S. Cl. 178—18 **15 Claims**

14. A stylus device being formed from a single piece of spring



steel and comprising:

a lower body portion;

an upper body portion extending from the lower body portion;

a pair of spaced shoulders formed at a distal end of the upper body portion, each of the spaced shoulders including an inwardly extending side surface defined by a curve having a first radius; and

a head supported on the upper body portion between the spaced shoulders and including an outwardly extending end surface having a central portion defined by a curve having a radius, the central portion of the outwardly extending end surface being rounded for controllably removing a layer of paint from a rotating painted substrate when in scuffing engagement therewith, wherein the outwardly extending end surface also has a pair of spaced end portions, each of the end portions being defined by a curve having a third radius wherein the length of the second radius is in the range of nine to eleven times a length of the third radius and the end portions of the outwardly extending end surface are rounded to prevent the outwardly extending end surface from damaging the rotating painted substrate at the end portions, and wherein the head further includes a pair of spaced parallel side surfaces, each of the spaced parallel side surfaces being formed between and interconnecting one of the inwardly extending side surfaces and one of the rounded end portions of the outwardly extending end surfaces.

5,486,659

STETHOSCOPE PROTECTION DEVICE AND METHOD FOR USING SAME

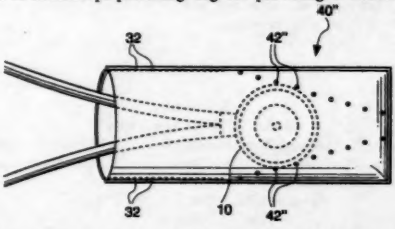
Stuart W. Rosenbush, 6643 N. Le Mai Ave., Lincolnwood, Ill. 60646-3101

Filed Mar. 8, 1994, Ser. No. 207,833

Int. Cl.[6] A61B *7/02*

U.S. Cl. 181—131 **9 Claims**

1. A stethoscope-protecting bag for protecting a stethoscope



from becoming contaminated during a stethoscopic examination of an animal, the stethoscope-protecting bag comprising a length of flexible tubular polymeric material defining a first rectangular

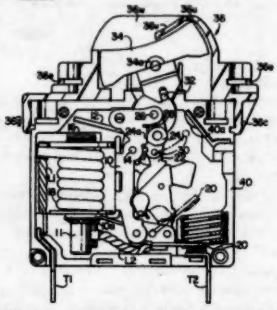
panel and a second rectangular panel which are joined at their lateral edges, the tubing being open at a first end and closed at a second end, the bag further comprising lines of weakness extending from the open end for at least a portion of the length of the bag, the lines of weakness being disposed substantially parallel to and adjacent to the joined lateral edges, whereby the first and second rectangular panel may be separated along the lines of weakness.

5,486,660

RESET ONLY ROCKER GUARD FOR SPLIT CASE CIRCUIT BREAKER

Michael Fasano, Watertown, Conn., assignor to Carlingswitch, Inc., Plainville, Conn.

Filed Jun. 15, 1994, Ser. No. 259,864
Int. Cl.[6] H01H *9/28*
U.S. Cl. 200—43.16 **4 Claims**



1. The combination comprising a rocker actuated circuit breaker and rocker bracket assembly therefor, said circuit breaker comprising a housing having opposite end faces and a front face, said front face having a raised boss adapted to fit a small panel opening, said boss defining a slot, said circuit breaker having a mechanism in the housing including a pivoted actuator link, said pivoted actuator link having a free end portion provided in said slot, said link being pivotably mounted in said housing for limited rotation on a fixed axis defined in the housing, and said link having a cross pin movably mounted in said slot for engaging a rocker, said bracket assembly including a U-shaped adapter plate of one piece plastic with resilient integrally formed leg portions at one end and at an opposite end thereof, said one piece plastic adapter plate having a resilient portion so that said leg portions are moveable with respect to one another in order to receive said circuit breaker front face as a result of bending said plate, said plate leg portions defining inturned lips for entry in openings defined in said circuit breaker end faces, said plate defining a generally rectangular raised boss adapted to fit a larger panel opening than that adapted to accommodate said raised boss of said circuit breaker front face, said plate defining a rearwardly open generally rectangular recess for receiving said rocker, said plate having an integrally molded front wall defining a window for exposing a portion of said rocker, said rocker having a portion accessible through said window for moving said rocker into one position, another portion of said rocker being hidden by said front wall thereby inhibiting movement of the rocker into another position.

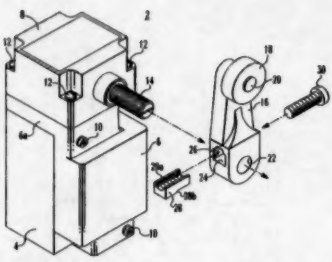
5,486,661

LIMIT SWITCH LEVER

George F. Jambor, New Berlin, Wis., and David W. Place, Hendersonville, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 12, 1994, Ser. No. 274,086
Int. Cl.[6] H01H *3/16*
U.S. Cl. 200—47 **13 Claims**

1. An electrical limit switch having a rotatable shaft and an actuator lever attached to said shaft, said actuator lever comprising:



a hole extending through said actuator lever adapted to receive said shaft therein;

a straight-sided cavity extending into said lever from one exterior side surface of said lever, said cavity partially intersecting said hole;

an opening in another exterior side surface of said lever, said opening extending into said cavity;

a screw projecting through said opening having a threaded shank disposed in said cavity;

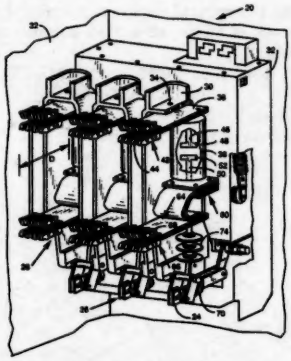
a key slidably disposed for reciprocal movement in said cavity, said key having a threaded portion engaged with said threaded shank and a straight-sided cross-sectional shape complemental to said straight-sided cavity preventing rotation of said key within said cavity, said key comprising a cam drawn against said shaft by rotation of said screw to clamp said lever to said shaft.

5,486,662

FLEXIBLE CONNECTOR FOR A CIRCUIT INTERRUPTER

Antonio I. Takilshi, Coraopolis, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 16, 1993, Ser. No. 93,287
Int. Cl.[6] H01H *9/00*
U.S. Cl. 200—50 AA **3 Claims**



1. A circuit interrupter system, comprising:

circuit interrupter means including a fixed contact and a movable contact;

fixed electrical terminal means; and

flexible connector means for connecting said movable contact with said fixed electrical terminal means, said flexible connector means comprising at least one stack of flexible sheets of a conducting material, each of said flexible sheets in said stack having a pair of opposed major surfaces with at least a portion of a major surface of one of said flexible sheets in said stack being in contact with at least a portion of a major surface of an adjacent one of said flexible sheets in said stack, said flexible sheets being constructed such that said flexible con-

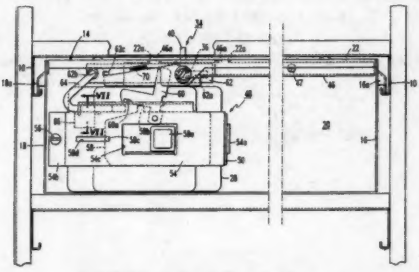
nector means can accommodate the movement of said movable contact, said stack being joined together by means at spaced apart zones near edges of said stack, whereby said flexible sheets stay together while maintaining the flexibility of said stack.

5,486,663

MOTOR CONTROL CENTER REMOVABLE CONTROL UNIT INTERLOCK

Ronald J. Fritsch, Menomonee Falls, and Richard J. Holland, Glendale, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 19, 1994, Ser. No. 325,739
Int. Cl.[6] H01H *9/20*
U.S. Cl. 200—50 R **11 Claims**



1. An interlock for a removable control unit of a motor control center comprising:

a motor control center cabinet having an opening for receiving a control unit, a structural member adjacent said opening, and electrical bus bars within said cabinet;

a control unit removably inserted into said opening, said control unit comprising:

plug-in terminal means engagable with said bus bars in an inserted position of said control unit;

switch means operable between ON and OFF positions connected to said plug-in terminal means;

operator means for operating said switch means between said ON and OFF positions; and

a latch manually movable between extended and retracted positions thereof, said latch engaging said structural member in said extended position blocking removal of said control unit from said cabinet, said latch also abutting said structural member in said extended position blocking insertion of a removed said control unit into said opening;

wherein said interlock comprises:

a slider slidably mounted on said control unit;

means extending from said slider to a location proximate said operator means in said OFF position of said switch means; and

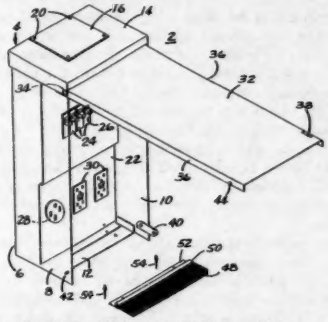
cooperating means on said slider and said latch for permitting sliding movement of said slider in said extended position of said latch and for blocking sliding movement of said slider in said retracted position of said latch, said means extending from said slider blocking movement of said operator means from said OFF position to said ON position in said retracted position of said latch, thereby preventing insertion of said control unit into said cabinet or removal of said control unit from said cabinet with said switch means in said ON position.

5,486,664

SEAL FOR CORD PASSAGEWAY OF POWER POD

William G. Lamp, Brookfield, and Clarence J. Spitzer, Grafton, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 27, 1994, Ser. No. 266,050
Int. Cl.[6] H01H *9/02*
U.S. Cl. 200—297 **17 Claims**



1. An enclosed electric power outlet comprising:

an enclosure case having an open side;

a plug-in electrical receptacle in said case accessible through said open side;

an opening in a wall of said case, said opening communicating with said open side;

an enclosure cover attached to said case closing said open side and cooperating with said opening to complete a closed-perimeter exit passageway for an electrical cord adapted to be plugged into said receptacle; and

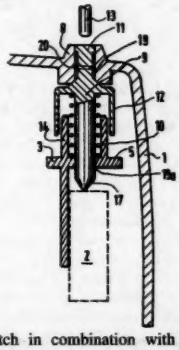
a compliant seal attached to said enclosure, said seal filling said passageway in a normal condition of said seal and being locally deflectable by said cord exiting said enclosure through said passageway to closely conform to said cord without distorting portions of said seal remote from said cord.

5,486,665

SAFETY SWITCH FOR A FOOD PROCESSOR

Claude Le Rouzic, Montceau-Les-Mines, France, assignor to Robot-Coupe SNC, France

Filed Apr. 21, 1994, Ser. No. 230,908
Claims priority, application France, Apr. 30, 1993, 93 05134
Int. Cl.[6] H01H *13/06*
U.S. Cl. 200—302.2 **3 Claims**



1. A safety switch in combination with a base for a food processor having a base with a surface on which a bowl closed by a lid is removably mounted, a plurality of drive attachments each being couplable inside the bowl via a drive shaft projecting through the bottom of the bowl, means for providing safe operation of a switch contained in the base in the form of a push rod having

upper and lower ends, the lower end of the push-rod coming into contact with the switch when the bowl is properly attached to the base and the lid closing the bowl is in a closed position wherein:

the surface of the base is formed with a tapering projection formed with a bore having a bore axis, the tapering projection protruding from the surface of the base;

the switch has a piston having a piston axis and a contact means having a body and a pusher, the body being mounted adjacent to the bore axis, the piston having an upper and a lower end, the upper end of the piston being slidably engaged in the bore formed in the tapering projection such that the bore axis and piston axis are coaxial, the piston being movable between a depressed and released position such that the upper end of the piston remains completely engaged in the tapering projection when the piston is in the released position, the upper end of the piston being actuated by the lower end of the push rod such that the upper end of the piston recedes into the bore formed in the tapering projection when the piston moves towards the depressed position, the lower end being operable to bear on the pusher when the piston is in the depressed position;

a support fixture which is mounted to the base, the contact means being mounted to the support fixture, the support fixture being formed with a bore having a support fixture bore axis, which is coaxial to the bore axis, and in which the lower end of the piston is slidably engaged, the piston having a protective skirt overlying and surrounding a portion of the support fixture, and wherein the support fixture has a ridge which slidably engages a vertical slot formed in the skirt.

5,486,666

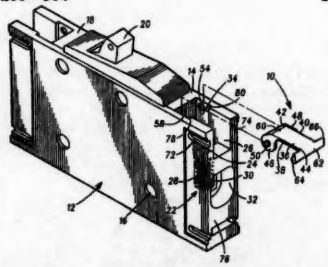
PROTECTIVE COVER FOR ELECTRICAL TERMINALS AND METHOD OF USING SAME

Tak M. Wong, Cedar Rapids; Ronald J. Etsheidt, Anamosa, and Patrick L. Freilinger, Cedar Rapids, all of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Nov. 24, 1992, Ser. No. 935,756

Int. Cl.[6] H01H *9/02*

U.S. Cl. 200—304 **16 Claims**



1. A cover for an exposed electrical terminal mounted on an electrical distribution device, the cover including:

a generally planar body having upper and lower surfaces and of sufficient size to substantially cover the exposed terminal, the body being defined by two side edges and two end edges and including a pair of rounded side flanges disposed at a first end of said body and being integrally formed with and extending perpendicularly downward from the side edges of the body, each side flange extending partially along a length of the side edge, a nib being centrally located on each side flange, each nib extending outwardly from the side flange, each nib being aligned to form a pivotal axis extending perpendicularly through the center of each nib, each nib being adapted to mate with a corresponding dimple located on the device, an end flange being integrally formed with and extending perpendicularly downward from the other end of the body which is opposite the side flanges, the end flange having opposite ends which extend beyond respective side edges of the body to define two distal edges, each distal edge having a tab projecting from the distal edge towards the nibs, each tab being adapted to abut with a corresponding indentation in the device;

wherein said nibs, when attached to said corresponding dimples, enable the body to be secured to the device so that a person's finger or equipment is prevented from contacting the exposed terminal while access to the remainder of the device is allowed, the nibs allowing the body to be manually attached and detached from the device, and allowing the body to pivot away from the exposed terminal to provide access to the terminal without detaching the entire cover from the device.

5,486,667

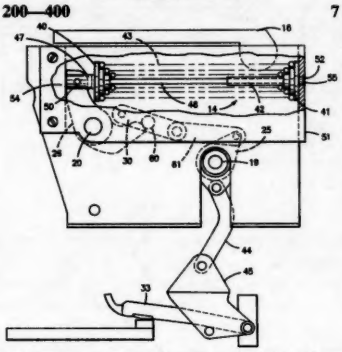
RATING MODULE UNIT FOR HIGH AMPERE-RATED CIRCUIT BREAKER

Roger N. Castonguay, Terryville; James L. Rosen, West Hartford, and Mark A. Zaffetti, Windsor Locks, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Feb. 28, 1994, Ser. No. 203,062

Int. Cl.[6] H01H *5/00*

U.S. Cl. 200—400 **7 Claims**



1. An industrial-rated circuit breaker for high-level overcurrent protection comprising:

an insulative base;

a pair of separable contacts within said base, one of said contacts being attached to a movable contact arm;

a contact arm carrier connecting with said movable contact arm within said base and with a contact arm drive link extending outside said base;

an insulative cover above said base, said cover enclosing a closing shaft and a drive shaft, said drive shaft connecting with said contact arm drive link for moving said contact arm carrier and said contact arm between open and closed positions;

a closing spring modular unit interacting with said closing shaft for providing closing bias force to said closing shaft;

said modular unit comprises:

a pair of front and rear opposing cylinders, one of said cylinders including a cylindrical extension;

a support rod removably connecting said cylinders, one end of said support rod extends within said cylindrical extension, said one end of said support rod being threaded;

a compression spring arranged on said support rod;

means on one of said cylinders providing connection with a circuit breaker operating mechanism; and

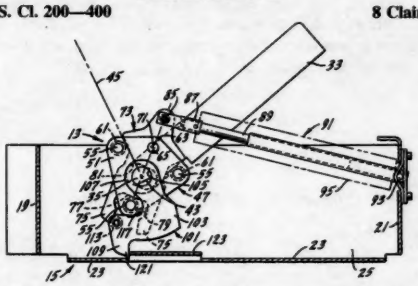
an interface cam interacting with said drive shaft for controlling when said drive link moves said contact arm between said open and closed positions.

5,486,668

OPERATING MECHANISM FOR A MANUALLY OPERATED LOAD BREAK SWITCH

James A. Erickson, Crystal Lake, Ill., assignor to Boltswitch, Inc., Crystal Lake, Ill.

Filed Jun. 6, 1994, Ser. No. 254,375
Int. Cl.[6] H01H 5/10
U.S. Cl. 200—400 8 Claims



1. An operating mechanism for a manually operated load break switch having an over center spring drive moved by an operating handle to open and close the switch, said operating mechanism including:

a shaft rotatable by said operating handle,

a follower rotatably mounted on said shaft,

an elongated forked plate pivotally mounted intermediate its length to said follower at a location radially outwardly of said shaft,

an operating lever for said switch pivotally mounted on said shaft and movable by engagement with said follower,

a driver affixed to said shaft for rotation therewith and positioned to engage and rotate said follower and said forked plate,

an over center spring drive pivotally connected to said forked plate at a location radially outwardly of said pivotal mounting of said forked plate to said follower, and

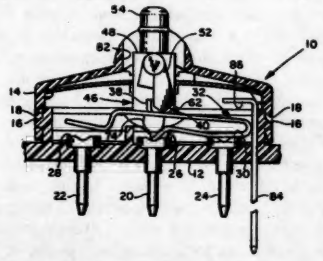
means to move said over center spring drive between fully closed and fully opened conditions of said switch by rotation of said operating handle while preventing alignment of said shaft, said pivotal mounting of the forked plate to said follower and said over center spring drive pivotal mounting to said forked plate when said spring drive is in its fully compressed condition.

5,486,669

DETENTED PADDLE BLADE SWITCH ASSEMBLY

Thomas J. Oshgan, Mt. Prospect, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 106,005, Aug. 13, 1993, abandoned.
This application Oct. 21, 1994, Ser. No. 326,886
Int. Cl.[6] H01H 3/20
U.S. Cl. 200—556 9 Claims



1. An electric switching assembly comprising:

(a) housing means;

(b) a contact blade member, said blade member comprising a unitary strip of electrically conductive spring material having an end formed in a generally U-shaped configuration, said strip terminating intermediate said U-shape and an opposite end of said strip;

(c) first and second stationary electrical side contacts mounted on said housing means and a common electrical contact spaced intermediate said first and second side contacts with the said U-shaped end of said blade member pivoted on said common terminal;

(d) actuating means pivotally mounted for user movement between a neutral position and a clockwise and anti-clockwise actuated positions on said housing means, said actuating means having portions thereof frictionally contacting said blade member intermediate said U-shape and said opposite end, wherein upon user movement of said actuating means to one of said actuated positions said blade member is resiliently deflected and moved between one of a clockwise and anti-clockwise position having said U-shaped portion contacting one of said first and second contacts with the said end opposite said U-shaped portion contacting the other of said first and second contacts in the other of said clockwise and anti-clockwise positions;

(e) spring means biasing said actuating means to the neutral position;

(f) means moveable on said actuating means including biasing means biasing said means in one direction; and,

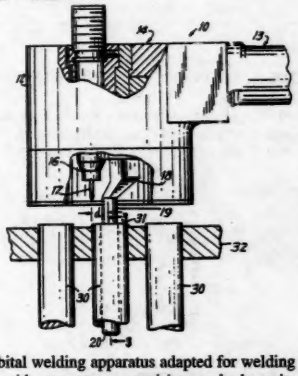
(g) said housing means defining detent surfaces located adjacent said contact blade member, wherein said moveable means is operable to directly contact said detent surfaces, and provide detenting of said actuating means between said clockwise and anti-clockwise positions.

5,486,670

PILOT PROBE FOR ORBITAL WELDING APPARATUS

Lucas H. Van Rhyn, Dansville, N.Y., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Jun. 24, 1994, Ser. No. 265,485
Int. Cl.[6] B23K 9/028
U.S. Cl. 219—60.2 7 Claims



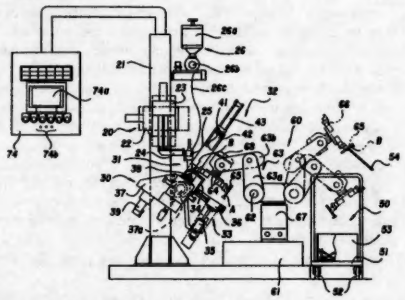
1. An orbital welding apparatus adapted for welding tubes into a tubesheet, said apparatus comprising: a body unit including a handle, a rotor unit rotatably mounted within the body unit and carrying a gas shielded type welding electrode, and a central pilot probe unit extending from said body unit lower side, said pilot probe unit having an elongated cylindrical shape and including a plurality of sets of diametrically-opposed balls longitudinally spaced apart along the pilot probe unit length, each said set including two spring-loaded balls retained in a transverse opening by an annular member having a reduced inner diameter and externally threaded transversely into the pilot probe unit, said balls each extending radially outwardly from the elongated pilot probe unit outer surface.

5,486,671

HARD FACING APPARATUS FOR APPLYING HARD FACING TO VALVES

Hiroshi Miyata; Yoshio Chiba, and Osami Noguchi, all of Okegawa, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Sep. 22, 1994, Ser. No. 310,068
Claims priority, application Japan, Dec. 7, 1993, 5-333731
Int. Cl.[6] B23K *9/04*
U.S. Cl. 219—76.14 2 Claims



1. A hard facing apparatus for applying a hard facing material to a valve head of an intake valve or an exhaust valve for use with internal combustion engines, said apparatus comprising:

a welding torch for performing hard facing on a valve head of a valve blank to be hard faced;

valve blank holding means for holding said valve blank in an oblique position such that said valve head of said valve blank faces said welding torch, and for rotating said valve blank about its axis; and

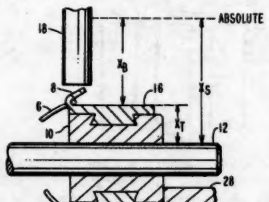
valve transfer means for transferring said valve blank to said valve blank holding means, said valve blank holding means comprising valve attaching/positioning means for attaching said valve blank to said valve blank holding means while positioning a stem of said valve blank so that an axis of said valve blank is substantially aligned with an axis of rotation of said valve blank holding means.

5,486,672

METHODS AND APPARATUS FOR COMMUTATOR FUSING

Federico Sbalchiero, and Alessandro Rossi, both of Florence, Italy, assignors to Axis USA, Inc., Marlborough, Mass.

Filed Dec. 13, 1993, Ser. No. 166,095
Int. Cl.[6] B23K *11/11*
U.S. Cl. 219—86.41 31 Claims



1. A machine for fusing electric motor armatures, each armature comprising a shaft and a commutator, the commutators having commutator bars with top surfaces to which coil leads are connected, the fusing machine comprising:

a primary electrode;

displacement sensor means for monitoring the displacement between said primary electrode and said shaft;

control means for controlling the displacement of said primary electrode relative to said shaft; and

means for applying force and heat to portions of the commutator bars with the primary electrode to compress the portions of the commutator bars onto the coil leads to form fused lead connections, wherein said control mean directs said means for applying force and heat to compress diametrically opposed portions of the commutator bars with said primary electrode toward common radial positions with respect to the shaft to balance the commutator.

5,486,673

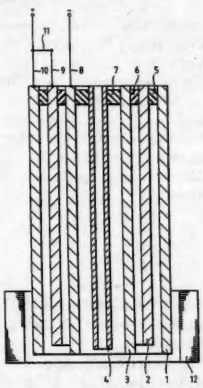
Patent Not Issued For This Number

5,486,674

PLASMA TORCH DEVICE FOR CHEMICAL PROCESSES

Steinar Lynum; Kjell Haugsten, both of Oslo; Ketil Hox, and Jan Hugdahl, both of Trondheim, all of, Norway, assignors to Kvaerner Engineering AS, Lysaker, Norway

PCT No. PCT/NO92/00195, § 371 Date Dec. 29, 1994, § 102(e) Date Dec. 29, 1994, PCT Pub. No. WO93/12633, PCT Pub. Date Jun. 24, 1993
PCT Filed Dec. 11, 1992, Ser. No. 244,295
Claims priority, application Norway, Dec. 12, 1991, 914907
Int. Cl.[6] B23K *10/00*
U.S. Cl. 219—121.52 2 Claims



1. A plasma torch for supplying energy, said plasma torch comprising a first, a second and a third tubular electrode with said second and third electrodes being located co-axially inside said first electrode and said third electrode being located inside said second electrode, said electrodes being electrically insulated from one another and having connections for electrical power, said third electrode having a feed-in tube located co-axially therein for supplying a raw material, said electrodes being composed of a non-metallic material with a high melting point and there being provided an annular space between said feed-in tube and said third electrode to provide a path for a plasma-forming gas and a reactant, said electrodes being mounted so as to be moveable relative to one another in an axial direction, said second electrode constituting an ignition electrode and being continuously connected to one of said second and third electrodes having the same polarity and voltage.

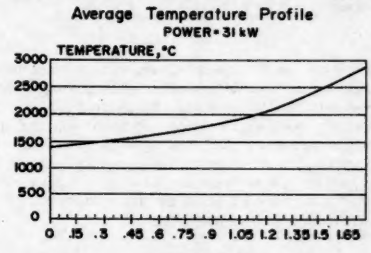
5,486,675
PLASMA PRODUCTION OF ULTRA-FINE CERAMIC CARBIDES

Patrick R. Taylor, and Shahid A. Pirzada, both of Moscow, Id., assignors to Idaho Research Foundation, Moscow, Id.

Division of Ser. No. 792,790, Nov. 15, 1991, Pat. No. 5,369,241, which is a continuation-in-part of Ser. No. 658,649, Feb. 22, 1991, abandoned. This application Aug. 18, 1994, Ser. No. 292,361

Int. Cl.[6] B23K *10/00*

U.S. Cl. 217—121.59 **12 Claims**



1. A method of producing ultra-fine ceramic carbides in a reactor using a plasma torch for providing heat to said reactor, said method comprising the steps of:

(a) injecting materials for reaction at points around a periphery of said torch into a first reaction temperature zone with a temperature above 3000° kelvin., said first reaction temperature zone including a first means for controlling temperatures;

(b) passing said reactants from said first zone to a second zone with a temperature between 2000° kelvin and 3000° kelvin, said second zone including a second means for controlling temperatures; and

(c) causing said reactants to enter a third zone for rapid quenching, said third zone having a temperature less than 2000° kelvin, said third zone including a third means for controlling temperatures.

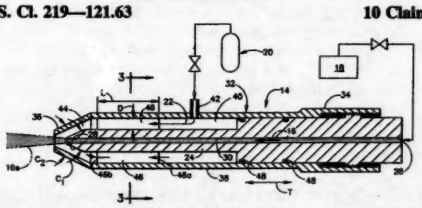
5,486,676
COAXIAL SINGLE POINT POWDER FEED NOZZLE

Stephen Aleshin, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 14, 1994, Ser. No. 339,388

Int. Cl.[6] B23K *26/14*

U.S. Cl. 219—121.63 **10 Claims**



1. A nozzle for ejecting powder metal in a stream toward a workpiece comprising:

an inner tube having an inlet for receiving said powder metal, an outlet for discharging said powder metal, and a supply channel therebetween;

an outer tube disposed radially outwardly of said inner tube and coaxially therewith, and having a mounting end fixedly Joined to said inner tube adjacent to said powder inlet, a nozzle outlet at an opposite distal end thereof, an intermediate portion axially therebetween spaced radially outwardly from said inner tube to define an annular flow manifold radially therebetween, and an inlet disposed in said intermediate portion for channeling a shaping gas into said manifold;

said powder outlet being disposed coaxially with said nozzle outlet and spaced axially aft therein to define therebetween an annular gas outlet for said manifold for channeling said shaping gas around said powder metal discharged from said powder outlet prior to discharge from said nozzle outlet; and

means disposed between said inner and outer tubes for confining said shaping as to confine said powder metal discharged from said powder outlet for reducing divergence of said discharged powder metal.

5,486,677
METHOD OF AND APPARATUS FOR MACHINING WORKPIECES WITH A LASER BEAM

Dora Maischner; Alexander J. Drenker, both of Aachen; Peter Abels, Alsdorf, and Eckhard Beyer, Aachen, all of, Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V., Munich, Germany

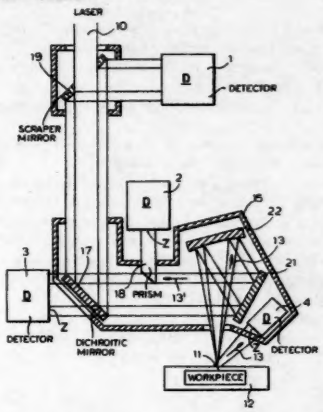
PCT No. PCT/DE92/00115, § 371 Date Aug. 19, 1993, § 102(e) Date Aug. 19, 1993, PCT Pub. No. WO92/14578, PCT Pub. Date Sep. 3, 1992

PCT Filed Feb. 19, 1992, Ser. No. 107,763

Claims priority, application Germany, Feb. 26, 1991, 41 06 007.5

Int. Cl.[6] B23K *26/00*

U.S. Cl. 219—121.83 **6 Claims**



1. A method of monitoring machining of a workpiece which comprises the steps of:

(a) directing a laser beam at said workpiece and melting same to a melting depth in the presence of a laser-induced signal-emitting plasma or vapor at a machining location;

(b) detecting signals emitted by said plasma or vapor at said location;

(c) subjecting the detected signals to frequency analysis and dividing the frequency analyzed signals into two different frequency bands;

(d) averaging amplitudes over said bands to obtain two amplitude values of average amplitudes each derived from one of said bands; and

(e) monitoring said depth by calculating a rating value from said amplitude values by forming a quotient therefrom.

5,486,678

PROCESS OF AND MACHINERY FOR JOINING TWO METAL SHEETS BY WELDING

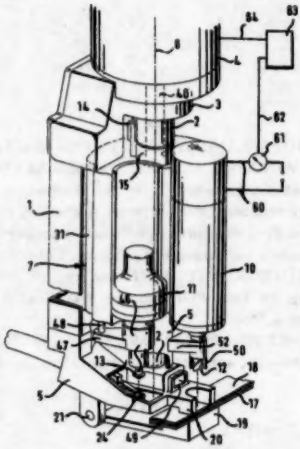
Jörg Hofmann, Giessen; Harald Knetsch, Herborn/Seelbach; Kurt Liebich, Lich; Reinhold Opper, Alten-Buseck; Hans Wiessler, Wettenberg, and Alois Bauer, St. Wolfgang, all of, Germany, assignors to Emhart Inc., Newark, Del.

Filed Mar. 1, 1994, Ser. No. 204,039

Claims priority, application Germany, Mar. 1, 1993, 43 06 282.2

Int. Cl.[6] B23K *9/007*

U.S. Cl. 219—127 28 Claims



1. A process for joining a plurality of stacked metal bodies at a plurality of weld points comprising the steps of

providing a welding machine including a drilling tool and a welding head;

sequentially operating said machine through a predetermined time cycle to successively:

drill said stacked bodies at a selected weld point to expose a fresh metal surface on each body;

initiate a welding arc at said selected weld point within a predetermined time after completion of said drilling step to prevent formation of more than a preselected depth of contaminant on said fresh metal surfaces, the operating parameters of said arc being preset to complete a weld joining said bodies even in the presence of said preselected depth of contaminant;

extinguish said arc; and

repeat said drilling, initiating and extinguishing steps at each of said plurality of weld points.

5,486,679

ARC WELDING CONTROL METHOD FOR A WELDING ROBOT

Masayuki Hamura; Mitsuhiro Okuda, and Yuuki Makihata, all of Oshino, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP93/01708, § 371 Date Aug. 4, 1994, § 102(e) Date Aug. 4, 1994, PCT Pub. No. WO94/13423, PCT Pub. Date Jun. 23, 1994

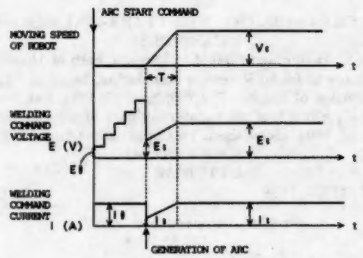
PCT Filed Nov. 22, 1993, Ser. No. 284,474

Claims priority, application Japan, Dec. 11, 1992, 4-352422

Int. Cl.[6] B23K *9/06*

U.S. Cl. 219—130.5 5 Claims

1. An arc welding control method for controlling arc welding operation of a welding robot having a machining electrode, comprising the steps of:



(a) setting a welding command voltage to a predetermined first voltage in response to an arc start command, to supply electric power between a workpiece and the electrode;

(b) gradually increasing the welding command voltage from the predetermined first voltage until an arc is generated between the workpiece and the electrode at an arc start voltage; and

(c) decreasing the welding command voltage to a predetermined second voltage lower than the arc start voltage, when the arc generated in step (b) is detected.

5,486,680

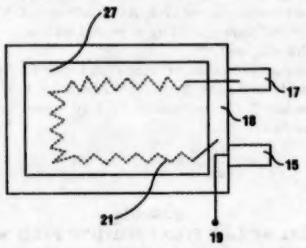
WARMING SYSTEM USING A FLEXIBLE BATTERY

Mitchell J. Lieberman, 24 Ethan Allan Ave., Colchester, Vt. 05446

Filed Jan. 10, 1994, Ser. No. 179,522

Int. Cl.[6] H01M *10/50;* H05B *3/34*

U.S. Cl. 219—211 7 Claims



1. A body warming apparatus comprising,

a substantially planar flexible battery having first and second battery terminals,

a substantially planar heating element coupled to said first and second battery terminals, said heating element being disposed overlaying and in close proximity with said flexible battery, whereby at least a portion of the heat from said heating element heats said battery.

5,486,681

DEVICE FOR HEATING UP ELECTRONIC BOARDS

Pierre Dagnac, Tournefeuille; Michel Leviandier, St Orens de Gameville, and Jean-Philippe Tigneres, Toulouse, all of, France, assignors to Thomson-CSF, Paris, France

PCT No. PCT/FR93/01075, § 371 Date Jun. 24, 1994, § 102(e) Date Jun. 24, 1994

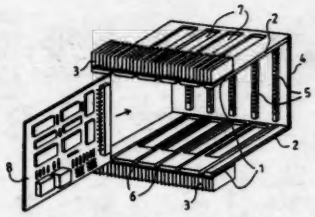
PCT Filed Oct. 29, 1993, Ser. No. 256,166

Claims priority, application France, Jan. 29, 1992, 92 12950

Int. Cl.[6] F27D *7/04*

U.S. Cl. 219—400 8 Claims

1. Device for heating up electronic boards comprising opposing board-guide walls with each having parallel guidance grooves for inserting said electronic boards therein, a back for interconnecting said walls,



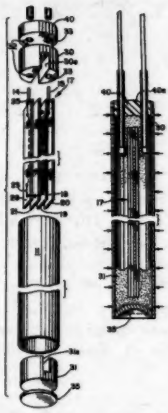
a heating element arranged on at least one of said board-guide walls on a side of a first board-guide wall opposite to said grooves, convection means associated with said heating element, and vents arranged in each of said board-guide walls with each of said vents located between said grooves so as to allow a circulation of heated air between said electronic boards.

5,486,682

HEATER ASSEMBLY FOR SWAGED CARTRIDGE HEATER AND METHOD OF MANUFACTURE

Robert A. Rysemus, Buffalo Grove, Ill., assignor to Acra Electric Corporation, Schiller Park, Ill.

Filed Oct. 21, 1992, Ser. No. 964,278
Int. Cl.[6] H05B *3/00*
U.S. Cl. 219—544 **7 Claims**



1. A cartridge heater assembly to be swaged, comprising:

a cylindrical sheath having a head end and a slug end;

a resistance heater unit in said sheath having a flat rectangular core of insulating material,

a resistance wire winding on said core with a first end turn at the head of said core and a second end turn at the slug end of said core, and

first and second flat rectangular core covers of insulating material one on each side of said core, in which the resistance wire at said first end turn extends through a hole in the adjacent core cover;

crushable heater unit centralizers at each end of the sheath, holding the resistance heater unit;

a plastic bushing closing the head end of the sheath;

a slug closing the slug end of the sheath; and

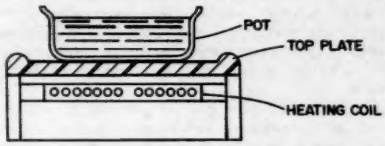
leads connected to the resistance wire winding and extending from the sheath, the connection between the resistance wire winding and the leads being enclosed in the crushable centralizer at the head end of the sheath with the resistance wires extending from the end turns and connected with said leads.

5,486,683

METHOD OF COOKING USING AN ELECTROMAGNETIC COOKER COVER PLATE

Tetsuo Shimizu, Yokosuka, and Naoki Wakita, Yokohama, both of, Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Continuation of Ser. No. 688,097, Apr. 19, 1991, abandoned.
This application Oct. 21, 1994, Ser. No. 327,149
Claims priority, application Japan, Apr. 20, 1990, 2-103012
Int. Cl.[6] H05B *6/12*
U.S. Cl. 219—622 **8 Claims**



1. A method of cooking edible liquid and solid foods comprising the steps of:

placing an edible liquid and/or solid food in a cookware article;

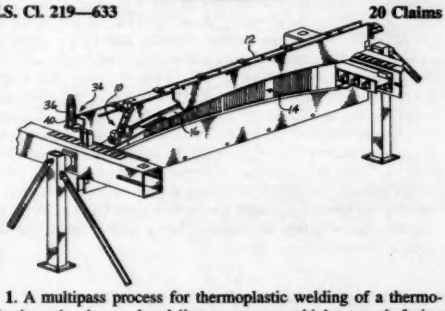
induction heating said food in said cookware article on an electromagnetic cooker cover plate, said cover plate formed by injection molding a polymeric composition, said composition comprising a wholly aromatic, liquid crystalline polyester and an inorganic filler, wherein said cover plate has a heat deformation temperature of at least 200° C. under a load of 18.5 kg/cm^2 whereby vibration and other noises generated during said cooking step are diminished.

5,486,684

MULTIPASS INDUCTION HEATING FOR THERMOPLASTIC WELDING

Todd R. Peterson, Federal Way, and Michael A. Walker, Sumner, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 3, 1995, Ser. No. 367,546
Int. Cl.[6] H05B *6/10*
U.S. Cl. 219—633 **20 Claims**



1. A multipass process for thermoplastic welding of a thermoplastic resin along a bond line to prepare a high strength fusion bond connecting two aerospace composite structural parts, comprising the steps of:

(a) inserting a susceptor between two faying surfaces of at least two thermoplastic composite parts to be welded together; the susceptor being made from a material susceptible to induction, having a substantially uniform pattern of openings extending through the material so that the susceptor heats substantially uniformly when subjected to the oscillating magnetic field produced with a induction coil, the susceptor defining a bond line where a fusion bond will connect the parts;

(b) positioning said induction coil in close proximity to said faying surfaces and applying electrical power to said coil to heat said susceptor sufficiently to soften the thermoplastic in said faying surfaces and to create a substantially uniform temperature in the softened thermoplastic;

(c) moving said coil in a first pass along said faying surfaces and simultaneously applying pressure to said parts to force said faying surfaces together to reduce irregularities that otherwise interfere with full surface area contact between the faying surfaces along the bond line and to produce intimate contact between the faying surfaces;

(d) solidifying the thermoplastic by stopping the induction which heats the susceptor;

(e) after said first pass, moving said coil while applying electrical power in a second pass along said faying surfaces and simultaneously applying pressure to said parts to soften the thermoplastic again and to further force said faying surfaces together to achieve intimate contact while having the thermoplastic heal to create a strong fusion bond by penetration of polymer chains in the thermoplastic of one faying surface into the molecular matrix of the thermoplastic in the other faying surface; and

(f) after said second pass, performing additional passes of said coil and simultaneous application of pressure to attain a welded bond line of the desired integrity and completeness.

5,486,685

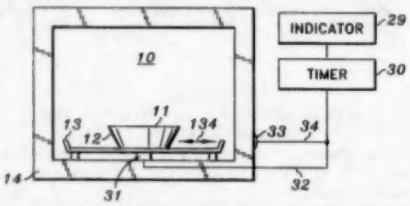
OVEN WITH FOOD PRESENCE INDICATOR

W. Jean Dodds, 938 Stanford, Santa Monica, Calif. 90403

Filed Nov. 23, 1994, Ser. No. 344,276

Int. Cl.[6] H05B *6/68*

U.S. Cl. 219—720 **13 Claims**



1. Apparatus for preventing the spoilage of food in an oven, in combination with an oven which includes a chamber within which there are means for receiving food for heating, a door to the chamber, the door being normally closed thereby providing for closure of the chamber in which the heating is effected, means for regular operation for generating heat in the chamber or in food in the chamber, a support in the chamber for locating the food in the chamber, and an indicator for signalling the existence of food in the chamber, comprising means for having the indicator be operational after the regular operation of the means for generating heat in the chamber or in the food, and when the heat-generating means is non-operating including a sensor, the sensor being sensitive to weight, and wherein a weight greater than a predetermined amount activates the indicator, the indicator being selectively at least one of light means or audio means.

5,486,686

HARDCOPY LOSSLESS DATA STORAGE AND COMMUNICATIONS FOR ELECTRONIC DOCUMENT PROCESSING SYSTEMS

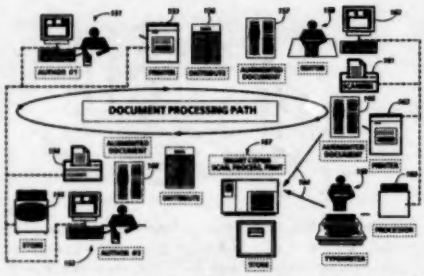
Frank Zdybel, Jr., Palo Alto; Henry W. Sang, Jr., Cupertino; Jan O. Pederson, Palo Alto; Z. E. Smith, III, Palo Alto; D. A. Henderson, Jr., Palo Alto; David L. Hecht, Palo Alto, and Dan S. Bloomberg, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 530,677, May 30, 1990, abandoned. This application May 18, 1992, Ser. No. 887,563

Int. Cl.[6] G06F *15/20*

U.S. Cl. 235—375 **19 Claims**

14. In an electronic document processing system having scanner means for transforming information from a hardcopy domain to an



electronic domain, and rendering means for transferring representations of human readable information from sources in at least one-of said domains to hardcopy documents in said hardcopy domain in accordance with a transform having known attributes, including system attributes which are not explicitly defined by said human readable information; the improvement comprising

means within said rendering means for printing a machine readable encoded description of at least one of the known system attributes, including system attributes which are not explicitly defined by said human readable information of said transform on said hardcopy documents along with said human readable information, such that at least one of said system attributes of said transform is stored on said hardcopy documents for retrieval when any of said hardcopy documents is transformed from said hardcopy domain to said electronic domain.

5,486,687

MEMORY CARD HAVING A RECESSED PORTION WITH CONTACTS CONNECTED TO AN ACCESS CARD

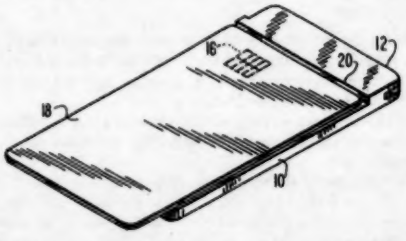
Jean-Yves Le Roux, Bouc Bel Air, France, assignor to Gemplus Card International, Gemenos, France

Continuation of Ser. No. 997,501, Dec. 28, 1992, Pat. No. 5,375,037. This application Sep. 27, 1994, Ser. No. 312,647

Claims priority, application France, Jan. 14, 1992, 92 00323

Int. Cl.[6] G06K *19/06; 5/00*

U.S. Cl. 235—382 **7 Claims**



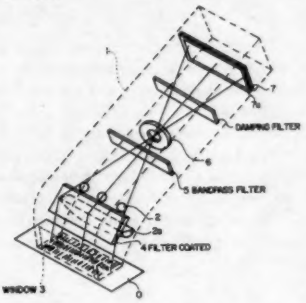
1. A plug-in memory card for a microcomputer, said card having several integrated circuit chips and a connector with several dozen plug-in contacts at an end of the card, said card also comprising a supplementary connector with a plurality of flush contacts on a first surface of the card, said supplementary connector being able to come into contact with a flat chip card, whose access contacts are flush on a face which is facing said first face further comprising card from a computer, into which it is plugged, as a function of the results of the communication.

5,486,688

NON-SCANNING TYPE OPTICAL READING APPARATUS HAVING ILLUMINATING EQUALIZATION FILTER

Mitsunori Iima; Kazuya Hara, and Atsumi Kaneko, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1992, Ser. No. 904,307
Claims priority, application Japan, Jun. 26, 1991, 3-154942
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—462 9 Claims



1. An optical reading apparatus comprising:

an imaging lens for imaging a two-dimensional pattern as an object to be read and forming a two-dimensional image thereof:

light-receiving means for reading information from the two-dimensional image of the two-dimensional pattern, the two-dimensional image being formed by light travelling from the two-dimensional pattern to the light receiving means; and

damping means for providing attenuation of the light provided to the light-receiving means, the attenuation varying in two dimensions depending on position of the light within the two-dimensional image, wherein said damping means is a bandpass filter for limiting the wavelength of said light reaching said light-receiving means, said bandpass filter being provided between said two-dimensional pattern and said light-receiving means and so set that given the wavelength of said light, a light component incident at an oblique angle to the bandpass filter will have a higher transmittance than a light component incident normal to the bandpass filter.

2. An optical reading apparatus comprising:

an imaging lens for imaging a pattern as an object to be read and forming an image thereof;

light-receiving means for reading information from the image of the pattern, the image being formed by light travelling from the pattern to the light-receiving means; and

damping means providing attenuation of the light, the attenuation varying depending on position of the light within the image,

the damping means comprising at least two light attenuating devices, each of the at least two light attenuating devices being one of a light-attenuating reflecting mirror and a light-attenuating transmission filter,

reflectance of the light-attenuating reflecting mirror varying with position along the surface of the mirror at which the light is reflected, and

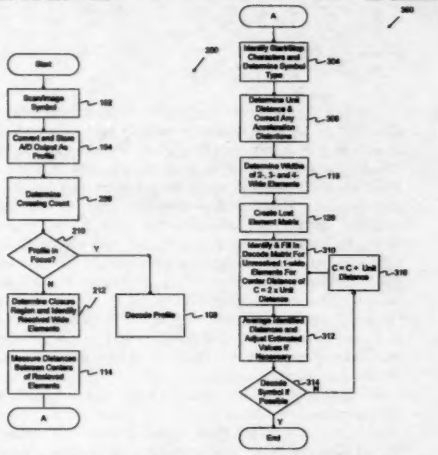
transmittance of the light-attenuating transmission filter varying with position along the surface of the filter through which the light is transmitted.

5,486,689

METHOD AND APPARATUS FOR DECODING UNRESOLVED MULTI-WIDTH BAR CODE SYMBOLOGY PROFILES

H. Sprague Ackley, Seattle, Wash., assignor to Intermec Corporation, Everett, Wash.

Continuation-in-part of Ser. No. 8,769, Jan. 22, 1993, Pat. No. 5,389,770. This application Oct. 24, 1994, Ser. No. 327,972
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—463 53 Claims


Start
Scan/Image Symbol
Convert and Store A/D Output As Profile
Determine Crossing Count
Profile Is Found?
Y
N
Determine Closure Region and Identify Resolved Wide Elements
Measure Distances Between Centers of Resolved Elements
A
Decode Profile
Identify Start/Stop Characters and Determine Symbol Type
Determine Unit Distance & Correct Any Acceleration Distortion
Determine Widths of 2-, 3- and 4-Wide Elements
Create Load Element Matrix
Identify & Fill In Decode Matrix For Unresolved 1-wide Elements For Center Distance of C = 2 x Unit Distance
C = C + Unit Distance
Average Identified Distances and Adjust Estimated Values If Necessary
Decode Symbol If Possible
N
Y
End

1. A method of decoding a bar code symbol representing encoded information, the bar code symbol including a plurality of relatively spaced bars having at least first, second and third widths, and spaces between the bars having at least first, second and third widths, the second and third widths being greater than the first width, the method comprising the steps of:

receiving light reflected from the bar code symbol and producing an output signal therefrom that represents the reflectance of the bars and spaces comprising the bar code symbol;

receiving the output signal and producing a wide feature signal resolving the bars and spaces having the second and third widths, but the wide feature signal failing to resolve at least some of the bars and spaces having the first width;

receiving the wide feature signal and determining which of the bars and spaces are resolved by defining a threshold and identifying a plurality of portions in the wide feature signal that extend beyond the threshold, each of the plurality of portions corresponding to one of the resolved bars and spaces;

measuring distances between the plurality of portions in the wide feature signal;

determining a narrow width of the bars and spaces having the first width based on the distances measured;

determining a number and location of the bars and spaces having the first width based on the determined width and the distances measured; and

determining the information encoded in the bar code symbol based on the determined number and location of bars and spaces having the first width.

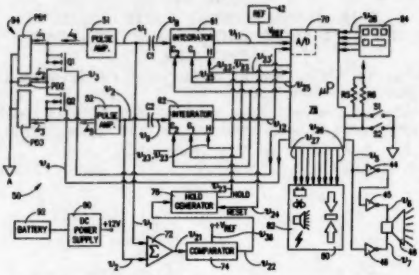
5,486,690

METHOD AND APPARATUS FOR DETECTING LASER LIGHT

DuWain K. Ake, Tipp City, Ohio, assignor to Apache Technologies, Inc., Dayton, Ohio

Filed Aug. 29, 1994, Ser. No. 297,116
Int. Cl.[6] H01J 40/14; G01C 3/08
U.S. Cl. 250—206.1 10 Claims

1. A light detecting circuit, comprising:



(a) a plurality of light-sensitive elements arranged in an array for detecting pulses of light energy striking said light detecting circuit, thereby creating a plurality of first electrical signals, wherein the magnitude of each of said plurality of first electrical signals is proportional to the power of light striking its corresponding light-sensitive element, each of the light-sensitive elements in said array having a known physical location with respect to one another, and each pair of adjacent light-sensitive elements forming an individual gap of known distance between the respective proximal edges of said pair of adjacent light-sensitive elements;

(b) at least one electrical switching device that alternately connects one of said plurality of first electrical signals to at least one of the other of said first electrical signals, thereby creating at least two interface signals;

(c) an amplifying and integrating circuit that amplifies and integrates each of said at least two interface signals, thereby creating a plurality of second electrical signals, wherein the gain of said amplifying and integrating circuit is automatically controlled so as to keep said plurality of second electrical signals within the active dynamic range of said light detecting circuit, and wherein the peak magnitude of each of said plurality of second electrical signals is proportional to the power and to the duration time of light striking its corresponding light-sensitive element;

(d) a comparator device that determines which of said plurality of second electrical signals is greater in magnitude, said greater second electrical signal being indicative of the physical location that substantially the center of said light energy is striking said array of light-sensitive elements; and

(e) a display for indicating said actual physical location, in comparison to the desired physical location, that substantially the center of said light energy is striking said array of light-sensitive elements.

5,486,691

MONITORING APPARATUS IN MACHINES

Gerhard Dieterle, Simonswald, Germany, assignor to Erwin Sick GmbH Optik-Eletronik, Waldkirch, Germany

Filed Oct. 5, 1993, Ser. No. 132,087

Claims priority, application Germany, Jan. 7, 1992, 42 33 810.7

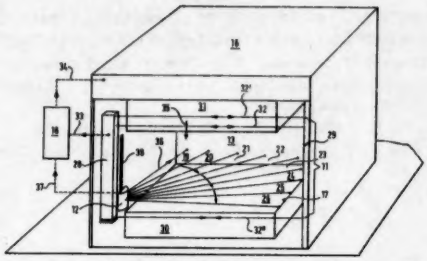
Int. Cl.[6] B62D *1/24*; B60T *7/16*

U.S. Cl. 250—221 **17 Claims**

1. A monitoring apparatus for a machine of the type having a working space in which dangerous working processes occur, the working space having at least one entry side through which an operator can enter or a work tool can be inserted, the apparatus comprising:

at least one protective light curtain arranged on the entry side of the working space and having a transmitter for transmitting light, a reflector for reflecting the light and a receiver for detecting the reflected light;

an evaluation circuit operatively coupled to the receiver and having a switch for terminating the dangerous working processes of the machine when the operator or the work tool passes by the light curtain; and



a rotational light sensor having a transmitter for transmitting light through the working space and a receiver for detecting the transmitted light, the rotational light sensor being rotatably coupled to the working space so that the light is scanned across at least a portion of the working space over a scanning plane having an angle of 0° to 60° with respect to a horizontal plane, the receiver being coupled to the evaluation circuit such that the switch terminates the dangerous working processes when the operator or the work tool are located within the scanning plane.

5,486,692

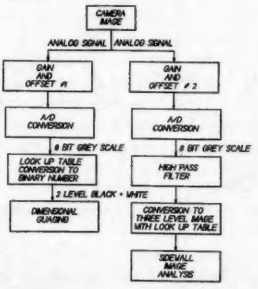
GLASSWARE INSPECTION MACHINE COMPRISING DIFFUSED LIGHT SOURCES AND TWO-DIMENSIONAL CAMERAS

Leo B. Baldwin, Horseheads, N.Y., assignor to Emhart Glass Machinery Investments Inc., Wilmington, Del.

Filed Oct. 19, 1994, Ser. No. 325,770

Int. Cl.[6] G01N *21/90*

U.S. Cl. 250—223 B **8 Claims**



1. An inspection machine for inspecting a vertically standing container comprising

a conveyor for horizontally displacing a vertically standing glass container through spaced first and second inspection locations,

a first pair of diffused light sources located behind said conveyor for forwardly directing 90° angularly related first and second beams of light substantially horizontally at a container located at one of said inspection locations, said first and second beams being sufficiently large so that said light beams will pass around the entire profile of a container located at said first inspection location,

a first two dimensional camera having a first imaging surface on the other side of said conveyor for issuing an analog signal representing the image on said imaging surface, and

first means for redirecting said forwardly directed beams to corresponding halves of said imaging surface,

a second pair of diffused light sources located in front of said conveyor for rearwardly directing 90° angularly related third and fourth beams of light parallel substantially horizontally at a container located at the other one of said inspection locations, said third and fourth beams being parallel to said first and second beams and being sufficiently large so that said light beams will pass around the entire profile of a container located at said second inspection location,

a second two dimensional camera having a second imaging surface on the side of said conveyor opposite to said second pair of diffused light sources for issuing an analog signal representing the image on said second imaging surface,

second means for redirecting said rearwardly directed third and fourth light beams to corresponding halves of the imaging surface of said second two dimensional camera, and

means for analyzing the analog signal from each of said cameras.

5,486,693

DETECTION OF TURBID CONTAMINANTS IN CONTAINERS BY DETECTING SCATTERED RADIANT ENERGY

Eugene K. Achter, Lexington; Helmut W. Klotzsch, Groton; Craig D. Thompson, Natick; Fuquan Gao, Cambridge, and Jonathan E. Bosworth, Acton, all of Mass., assignors to Thermedics Detection Inc., Chelmsford, Mass.

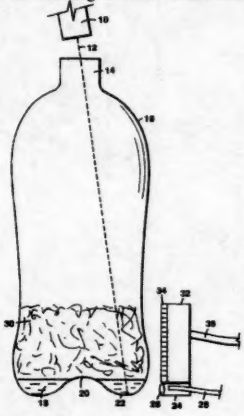
Continuation-in-part of Ser. No. 268,198, Jun. 29, 1994, which is a continuation-in-part of Ser. No. 198,217, Feb. 17, 1994.

This application Nov. 8, 1994, Ser. No. 337,817

Int. Cl.[6] G01N *21/24*

U.S. Cl. 250—223 B **33 Claims**

1. A method of detecting a turbid contaminant in a moving



container, comprising:

selecting a wavelength for which energy having said wavelength is absorbed by contents of the moving container that include the turbid contaminant at a different level than energy having said wavelength is absorbed by contents of the moving container that include a non-contaminant,

producing radiant energy having said wavelength,

directing the radiant energy into the moving container,

electronically detecting a level of radiant energy scattered by contents of the moving container, and

indicating the presence of a turbid contaminant when the detected level of scattered radiant energy differs from a threshold level.

5,486,694

WOBBLE CORRECTION AND FOCUSING OPTICAL ELEMENT WITH REFRACTIVE TOROIDAL SURFACE AND BINARY DIFFRACTIVE OPTICAL SURFACE

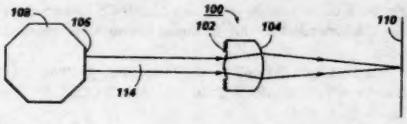
Ellis D. Harris, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 2, 1994, Ser. No. 348,415

Int. Cl.[6] H01J *3/14*

U.S. Cl. 250—236 **5 Claims**

1. An optical scanning system for wobble correction and focus-



ing a light beam at a scan line comprising:

a rotating polygon mirror with a plurality of facets,

means for generating a collimated light beam directed onto one of said facets, and

an optical element which focuses said light beam reflected off said one of said facets to a scan line and corrects for wobble of said light beam at said scan line, said optical element comprising a binary diffractive optical surface and a refractive toroidal lens surface.

5,486,695

STANDOFF COMPENSATION FOR NUCLEAR LOGGING WHILE DRILLING SYSTEMS

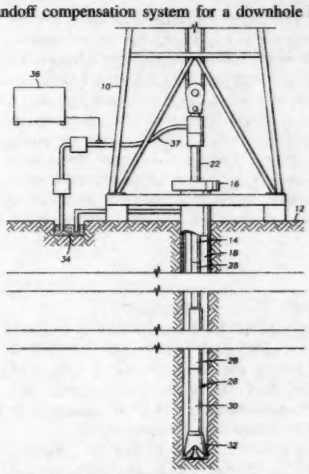
Ward E. Schultz, Fulshear, and Gordon L. Moake, Houston, both of Tex., assignors to Halliburton Company, Dallas, Tex.

Filed Mar. 29, 1994, Ser. No. 219,062

Int. Cl.[6] G01V *5/04*

U.S. Cl. 250—261 **30 Claims**

1. A standoff compensation system for a downhole LWD tool,



said LWD tool forming part of a bottomhole drilling assembly to drill a borehole, comprising:

a sensor for measuring formation parameters based on nuclear count data and generating a signal indicative thereof;

a sensor for determining the standoff distance between the borehole wall and the LWD tool and generating a signal indicative thereof;

a downhole processor for receiving the signal indicative of standoff distance and developing a weight factor therefrom, said processor also receiving said signal indicative of the nuclear count data and modifying the nuclear count data based on said weight factor; and

wherein the weight factor is determined based upon a weight function relationship.

5,486,696

PROCEDURE AND APPARATUS FOR THE ANALYSIS OF SURFACE AND/OR DEPTH PROFILES

Karl-Heinz Muller, Werne, and Hans Oechsner, Kaiserslautern, both of, Germany, assignors to SPECS Gesellschaft fur Oberflachenanalytik and Computertechnologie mbH, Germany

PCT No. PCT/EP92/00067, § 371 Date Mar. 9, 1994, § 102(e) Date Mar. 9, 1994, PCT Pub. No. WO92/13268, PCT Pub. Date Aug. 6, 1992

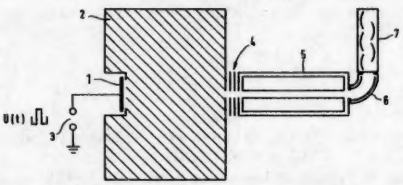
PCT Filed Jan. 14, 1992, Ser. No. 90,109

Claims priority, application Germany, Jan. 15, 1991, 41 00 980.0

Int. Cl.[6] H01J *49/14*

U.S. Cl. 250—288 **8 Claims**

1. Procedure for analyzing the surface and/or depth profile of



specimens, said specimens being completely or partially electrically non conductive, employing the direct bombardment method of the secondary neutral-particle mass spectrometry SNMS, comprising the steps of:

applying a high-frequency alternating voltage to an underside of a specimen, said specimen having an upperside in direct contact with a low-pressure plasma; wherein said alternating voltage has high frequency periods wherein, during negative voltage phases of said high-frequency periods, said upperside of said specimen is bombarded by positive ions from said plasma with a constant kinetic energy for producing neutral atoms and molecules and, during positive voltage phases of said high-frequency periods, said upperside of said specimen is bombarded by electrons from said plasma for compensating the charge produced on said specimen by said positive ions.

5,486,697

ARRAY OF MICRO-MACHINED MASS ENERGY MICRO-FILTERS FOR CHARGED PARTICLES

Roland E. Stalder, Pasadena; Thomas R. Van Zandt, Redondo Beach; Michael H. Hecht, Los Angeles, and Frank J. Grunthaner, Glendale, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Nov. 14, 1994, Ser. No. 338,400

Int. Cl.[6] H01J *37/12*

U.S. Cl. 250—305 **18 Claims**

1. An energy filter for charged particles comprising:

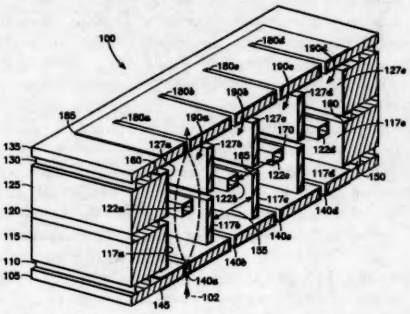
(A) a stack of micro-machined wafers comprising:

(1) plural apertures passing through said stack of wafers,

(2) focusing electrodes bounding charged particle paths through said apertures,

(3) an entrance orifice to each of said plural apertures and an exit orifice from each of said plural apertures; and

(B) means for biasing said focusing electrodes with an electrostatic potential corresponding to an energy pass band of said filter.



5,486,698

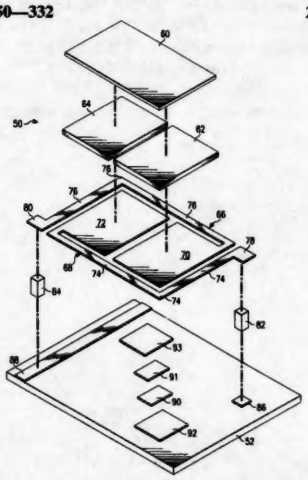
THERMAL IMAGING SYSTEM WITH INTEGRATED THERMAL CHOPPER

Charles M. Hanson, Richardson; Dana Dudley, and James E. Robinson, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 19, 1994, Ser. No. 229,497

Int. Cl.[6] G01J *5/10*

U.S. Cl. 250—332 **22 Claims**



1. A thermal sensor mounted on a substrate to provide a signal representative of the amount of thermal radiation incident to the thermal sensor, comprising:

thermal sensitive material for generating a biased signal representing total radiance from the scene and for generating a reference signal by shunting the thermal sensitive material with the substrate;

at least one flexible arm for allowing selective deflection of the thermal sensitive material to contact the substrate and form the reference signal; and

a signal flow path from the thermal sensitive material to a respective contact pad disposed on the substrate; and

the signal flow path providing a reference signal representative of the temperature of the substrate when the thermal sensitive material deflects to contact the substrate.

5,486,699

NON-DISPERSIVE INFRARED SPECTROMETER

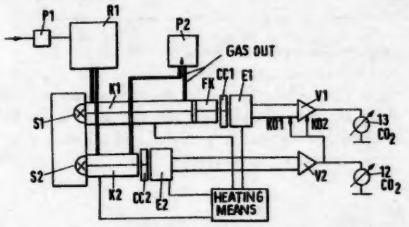
Walter Fabinski, Kriftel; Gerhard Wiegleb, Neu-Anspach; Peter Hering; Werner Fuss, both of Garching, and Michael Haisch, Düsseldorf, all of, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Continuation of Ser. No. 96,017, Jul. 22, 1993. This application Jan. 13, 1995, Ser. No. 372,868

Claims priority, application Germany, Jul. 22, 1992, 42 24 146.4

Int. Cl.[6] G01N *21/35*

U.S. Cl. 250—345 17 Claims



1. A method of selectively determining an isotope portion of a measuring gas by means of non-dispersive infrared spectroscopy, the method comprising sensitizing the measuring gas in a first ray path to an isotope component $*A_xB_y$ and sensitizing the measuring gas in a second ray path to the isotope-pure measuring gas A_xB_y, electronically amplifying the measurement results, carrying out an additional optical filtering in the first ray path by a filter essentially filled with isotope-pure measuring gas A_xB_y, and using the electronic measuring value of the second ray path for influencing an amplification factor and an offset in the measurement result of the first ray path.

5,486,700

PROXIMITY CONTROLS FOR GAMMA CAMERA

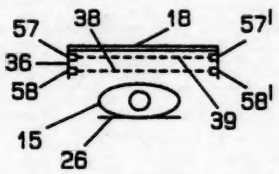
Alex Silberklang, Haifa, and Israel Ohana, Kiryat Tivon, both of, Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Dec. 27, 1993, Ser. No. 172,728

Claims priority, application Israel, Dec. 31, 1992, 104292

Int. Cl.[6] G01T *1/166*

U.S. Cl. 250—363.04 22 Claims



1. A gamma camera system comprising:

a gantry having at least one gamma camera mounted thereon fop use in performing scans of a patient, controls for minimizing the distance between the patient and the gamma camera during said scans, said controls limited to a first proximity control for providing a first energy screen of multiple energy beams at a first distance from the detector of the gamma camera and a second proximity control for providing a second energy screen of multiple energy beams at a second distance from the detector of the gamma camera, said second distance being larger than said first distance,

said controls minimizing the distance between the gamma camera and the patient's body by controlling the movements of the gamma camera to maintain the contour of the patient's body between said first and second energy screens,

said multiple energy beams being comprised of a number of beams sufficiently close to each other so that cross-talk may occur between individual transmitters and receivers that are not oppositely disposed, and

a cross-talk avoidance arrangement for avoiding cross-talk between individual receivers and transmitters that are not oppositely disposed.

5,486,701

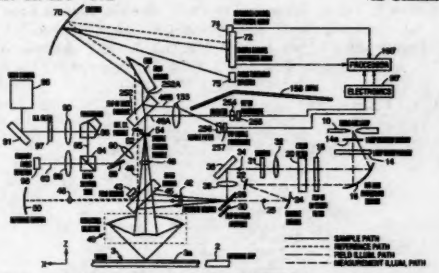
METHOD AND APPARATUS FOR MEASURING REFLECTANCE IN TWO WAVELENGTH BANDS TO ENABLE DETERMINATION OF THIN FILM THICKNESS

Adam E. Norton, Palo Alto, and Hung V. Pham, San Jose, both of Calif., assignors to Prometrix Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 899,666, Jun. 16, 1992, abandoned. This application Mar. 28, 1994, Ser. No. 218,975

Int. Cl.[6] G01N *21/27*

U.S. Cl. 250—372 42 Claims



1. A method for performing optical reflectance measurements on a sample having a very thin film, the method including the steps of:

(a) focusing a first beam of radiation onto a selected area of the sample, said first beam including UV components in a UV frequency band and visible components in a visible frequency band;

(b) receiving a reflected portion of the first beam that has reflected from the selected area, and separating the reflected portion into a second beam including the UV components and a third beam including the visible components;

(c) generating a first signal indicative of intensity of the second beam;

(d) generating a second signal indicative of intensity of the third beam;

(e) processing the first signal and the second signal to generate a reflected ratio signal indicative of relative intensity of the second beam and the third beam; and

(f) processing the reflected ratio signal to generate data indicative of thickness of the very thin film.

5,486,702

SCAN TECHNIQUE TO REDUCE TRANSIENT WAFER TEMPERATURES DURING ION IMPLANTATION

John P. O'Connor, Andover, and John W. Smith, Newburyport, Mass., assignors to Genus, Inc., Sunnyvale, Calif.

Filed Sep. 21, 1993, Ser. No. 125,117

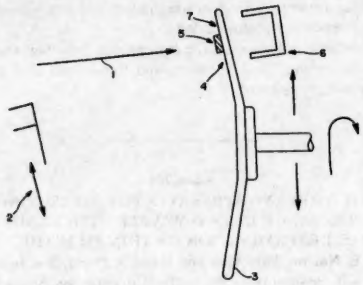
Int. Cl.[6] H01J *37/317*

U.S. Cl. 250—492.21 13 Claims

1. Method of ion implantation comprising

directing an ion beam at a target and mechanically imparting a scanning movement between said beam and said target, wherein

slow active ion-implantation mechanical scans in one direction are alternated with rapid inactive ion-implantation mechanical scans in the reverse direction.

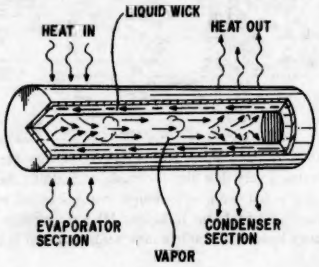


5,486,703

HYDRONIC COOLING OF PARTICLE ACCELERATOR WINDOW

Joseph R. Lovin, Greer, and David S. Shevick, Taylors, both of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation of Ser. No. 955,529, Oct. 1, 1992, abandoned.
This application Sep. 2, 1994, Ser. No. 300,689
Int. Cl.[6] H01J *7/18;37/30*
U.S. Cl. 250—492.3 12 Claims



1. A method of irradiating an article, comprising the steps of:

providing an electron beam accelerator, said accelerator comprising a window, a target region, and a heat pipe for cooling the window; wherein said heat pipe comprising a hollow tube having an evaporator section in contact with the window and a condenser section, a volatile liquid in said hollow tube, and a wick;

irradiating an article in the target region;

cooling the window while irradiating the article; and providing an inert gas to the target region during the irradiating to substantially decrease ozone production.

5,486,704

SEMICONDUCTOR DEVICE AND ELECTRONIC DEVICE BY USE OF THE SEMICONDUCTOR

Masakazu Morishita, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 780,397, Oct. 23, 1991, Pat. No. 5,272,357, which is a continuation of Ser. No. 619,527, Nov. 29, 1990, abandoned. This application Sep. 10, 1993, Ser. No. 118,751
Claims priority, application Japan, Nov. 30, 1989, 1-311550; Feb. 28, 1990, 2-48320; Feb. 28, 1990, 2-48321
Int. Cl.[6] H01L *29/72*
U.S. Cl. 257—9 10 Claims

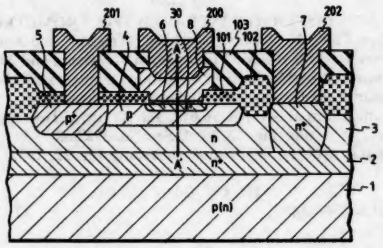
1. A semiconductor device comprising:

a collector region of first conductivity type;

a base region of second conductivity type;

an emitter region of the first conductivity type;

a thin film provided on said emitter region in which tunnel current for both electron and hole carriers can flow; and



a polycrystalline layer laminated on said thin film;

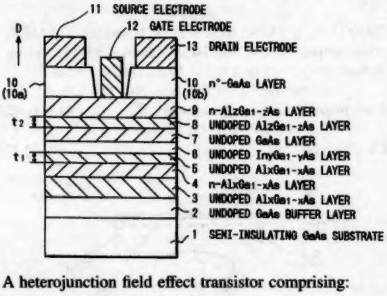
wherein, between said emitter region and said polycrystalline layer a Fermi level of said polycrystalline layer and a Fermi level of said emitter region are aligned so as to form a potential barrier against a carrier injected from said base region into said emitter region.

5,486,705

HETEROJUNCTION FIELD EFFECT TRANSISTOR

Kaoru Inoue, Kadoma; Toshinobu Matsuno, Katano; Tadayosi Nakatuka, Osaka, and Hiroyuki Masato, Kadoma, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 9, 1994, Ser. No. 257,125
Claims priority, application Japan, Jun. 15, 1993, 5-143442
Int. Cl.[6] H01L *29/06*
U.S. Cl. 257—24 26 Claims



1. A heterojunction field effect transistor comprising:

(a) a semi-insulating GaAs substrate;

(b) a heterojunction structure formed on said semi-insulating GaAs substrate in a predetermined direction, said heterojunction structure comprising:

(i) an active layer comprising a channel layer including an undoped InGas layer, wherein 0.05=y=0.30, and an undoped GaAs layer formed on and in contact with said undoped $In_yGa_{1-y}As$ layer in said predetermined direction; and

(ii) first and second AlGaAs layers doped with first and second dopants, respectively, sandwiching said active layer, said second AlGaAs layer being provided between said active layer and said semi-insulating GaAs substrate;;

(c) a source electrode structure formed on a first area of said

(d) a gate electrode structure formed on a second area of said heterojunction structure and

(e) a drain electrode structure formed on a third area of said heterojunction structure.

5,486,706

QUANTIZATION FUNCTIONAL DEVICE UTILIZING A RESONANCE TUNNELING EFFECT AND METHOD FOR PRODUCING THE SAME

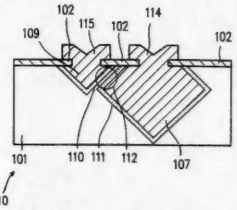
Koichiro Yuki, Neyagawa; Yoshihiko Hirai, Osaka; Kiyoshi Morimoto, Neyagawa; Masaaki Niwa, Hirakata; Juro Yasui, Toyonaka; Kenji Okada, Suita, and Masaharu Udagawa, Tokyo, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 26, 1994, Ser. No. 249,541

Claims priority, application Japan, May 26, 1993, 5-123732; Jan. 7, 1993, 5-251565; Dec. 22, 1993, 5-325076; Mar. 24, 1994, 6-053972

Int. Cl.[6] H01L *29/88;31/036*

U.S. Cl. 257—25 11 Claims



1. A quantization functional device, comprising:

a silicon thin plate having a plurality of side walls each having a surface orientation of (111), a distance between the plurality of side walls being sufficiently thin as to allow the silicon thin plate to act as a quantum well;

a pair of tunneling barriers respectively provided on surfaces of the side walls of the silicon thin plate; and

a first electrode and a second electrode sandwiching the pair of tunneling barriers.

5,486,707

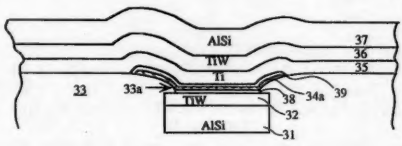
ANTIFUSE STRUCTURE WITH DOUBLE OXIDE LAYERS

Kevin T. Look, Fremont, and Evert A. Wolsheimer, Sunnyvale, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Continuation of Ser. No. 933,428, Aug. 21, 1992, abandoned. This application Jan. 10, 1994, Ser. No. 182,519

Int. Cl.[6] H01L *29/04;27/02*

U.S. Cl. 257—52 20 Claims



1. An antifuse structure comprising:

a first conductive layer including a refractory metal;

a first oxide layer comprising an oxide of said refractory metal;

an amorphous silicon layer formed on said first oxide layer;

a second oxide layer comprising an oxide of said amorphous silicon layer; and

a second conductive layer formed on said second oxide layer, wherein said antifuse structure provides a programming voltage range of approximately 7.5 volts to approximately 10.0 volts.

5,486,708

LIGHT VALVE DEVICE USING SEMICONDUCTIVE COMPOSITE SUBSTRATE

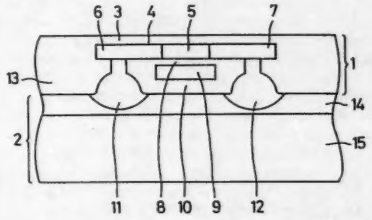
Kunihiro Takahashi; Yoshikazu Kojima; Hiroaki Takasu; Nobuyoshi Matsuyama; Hitoshi Niwa; Tomoyuki Yoshino, and Tsuneo Yamazaki, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Division of Ser. No. 791,912, Nov. 13, 1991, Pat. No. 5,347,154. This application Jun. 23, 1994, Ser. No. 264,635

Claims priority, application Japan, Nov. 15, 1990, 2-309437; Jan. 23, 1991, 3-6561; Feb. 16, 1991, 3-22420; Apr. 11, 1991, 3-79330; Apr. 11, 1991, 3-79337

Int. Cl.[6] H01L *33/00*

U.S. Cl. 257—59 14 Claims



1. A light valve device comprising: a drive substrate having a drive electrode and an electrically connected drive circuit for exciting the drive electrode in response to a predetermined signal; an opposed substrate arranged opposite to the drive substrate; and an electrooptical material layer arranged between the drive substrate and the opposed substrate, wherein the drive substrate includes a transparent insulating thin film layer and a single crystal semiconductor thin film layer formed over the transparent insulating thin film layer, wherein the drive circuit includes a transistor element formed in the single crystal semiconductor thin film layer, and wherein the drive electrode is integrally arranged on one of the single crystal thin film layer and the transparent insulating thin film layer so that the drive electrode is excited by the drive circuit to control the optical transparency of the electrooptical material layer.

5,486,709

SURGE PROTECTION DEVICE

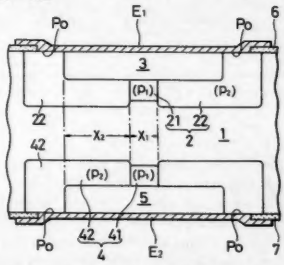
Yutaka Hayashi, Tsukuba; Masaaki Sato, Machida, and Yoshiki Maeyashiki, Chofu, all of, Japan, assignors to Agency of Industrial Science & Technology; Ministry of International Trade & Industry; Sankosha Corporation, all of Tokyo, and Optotechno Co., Ltd., Kanagawa, all of, Japan

Filed Mar. 26, 1993, Ser. No. 38,623

Claims priority, application Japan, Mar. 27, 1992, 4-100233

Int. Cl.[6] H01L *29/74*

U.S. Cl. 257—110 18 Claims



1. A surge protection device comprising a first semiconductor region, a second semiconductor region forming a first pn junction with the first semiconductor region, at least one third semiconductor region facing the first semiconductor region across the second semiconductor region and forming a second pn junction with the

second semiconductor region, a fourth semiconductor region forming a third pn junction with the first semiconductor region at a place apart from the second semiconductor region, the second semiconductor region being comprised of a punch-through generation region portion and a punch-through suppression region portion, the punch-through suppression region portion being disposed to cover corners of the at least one third semiconductor region, the punch-through generation region portion being disposed only between flat facing portions of the at least one third semiconductor region and the first semiconductor region, a first ohmic electrode disposed in common ohmic contact with surfaces of the second and at least one third semiconductor regions, and a second ohmic electrode disposed in ohmic contact with the fourth semiconductor region;

wherein application across the first ohmic electrode and the second ohmic electrode of a surge of a polarity causing the first pn junction to be reverse biased causes a depletion layer to grow in the punch-through generation region portion of the second semiconductor region and reach the at least one third semiconductor region to cause punch-through and initiate breakdown operation between the first and at least one third semiconductor regions, whereafter current flowing between the first and second ohmic electrodes increases to produce in the second semiconductor region a voltage drop which turns on the second pn junction and causes the surge protection device to exhibit a breakover characteristic,

wherein the punch-through generation region portion and the punch-through suppression region portion constituting the second semiconductor region are of the same conductivity type but an impurity concentration of the punch-through generation region portion is lower than that of the punch-through suppression region portion, whereby the punch-through generation region portion permits punch-through to occur between the first and at least one third semiconductor regions and the punch-through suppression region portion suppresses the occurrence of punch-through between the first and at least one third semiconductor regions.

5,486,710

FIELD EFFECT TRANSISTOR

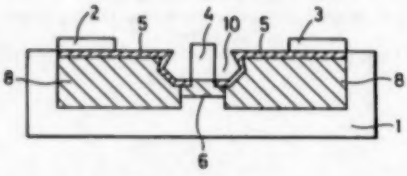
Toshiaki Kitano, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 133,378, Oct. 8, 1993, abandoned. This application Feb. 7, 1995, Ser. No. 385,089

Claims priority, application Japan, Jan. 9, 1992, 4-298136; Mar. 16, 1993, 5-055252

Int. Cl.[6] H01L *31/0328;29/80;31/112*

U.S. Cl. 257—192 **6 Claims**



1. A field effect transistor comprising:

a semi-insulating GaAs substrate having a recess;

a gate electrode disposed in the recess;

a low carrier concentration region disposed in said GaAs substrate beneath the gate electrode;

first and second high carrier concentration regions having a higher carrier concentration than the low carrier concentration region disposed in said GaAs substrate at opposite sides of the recess and in contact with the low carrier concentration region;

third and fourth high carrier concentration regions having a higher carrier concentration than the first and second high carrier concentration regions disposed at the surface of the low carrier concentration region in the recess except beneath the gate electrode;

spaced apart source and drain electrodes disposed on the first and second high carrier concentration regions, respectively; and

fifth and sixth regions having a carrier concentration higher than that of the first and second high carrier concentration regions, disposed in the first and second high carrier concentration regions, reaching opposite side surfaces of the recess and portions of the first, second, third, and fourth high carrier concentration regions.

5,486,711

SOLID-STATE IMAGE SENSOR WITH OVERLAPPING SPLIT GATE ELECTRODES

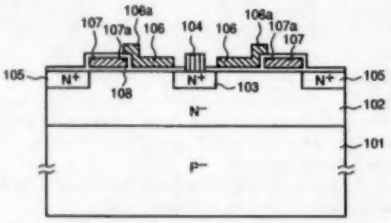
Tomohisa Ishida, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 24, 1994, Ser. No. 265,723

Claims priority, application Japan, Jun. 25, 1993, 5-154716

Int. Cl.[6] H01L *27/14;31/00*

U.S. Cl. 257—258 **4 Claims**



1. A solid-state image sensor comprising a plurality of picture elements, each of said picture elements comprising:

a semiconductor substrate of a first conductivity type;

a semiconductor layer of a second conductivity type formed on said semiconductor substrate;

a source region and a drain region of said second conductivity type, each of which is formed in a surface of said semiconductor layer and having a higher impurity density than that of said semiconductor layer; and

a plurality of split gate electrodes formed on the surface of said semiconductor layer between said source region and said drain region and insulated from said semiconductor layer surface, said split gate electrodes overlapping each other through an insulator layer.

5,486,712

DRAM HAVING PERIPHERAL CIRCUITRY IN WHICH SOURCE-DRAIN INTERCONNECTION CONTACT OF A MOS TRANSISTOR IS MADE SMALL BY UTILIZING A PAD LAYER AND MANUFACTURING METHOD THEREOF

Hideaki Arima, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

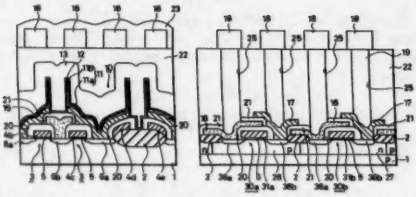
Continuation of Ser. No. 690,843, Apr. 24, 1991, abandoned. This application Apr. 25, 1994, Ser. No. 232,315

Claims priority, application Japan, May 1, 1990, 2-115642

Int. Cl.[6] H01L *27/108;29/772*

U.S. Cl. 257—296 **15 Claims**

1. A DRAM including a memory cell region having a plurality of memory cells each formed of at least one MOS transistor and one capacitor, and a peripheral circuit for writing/reading prescribed memory information to and from the memory cell region, on a main surface of a semiconductor substrate, said DRAM comprising:



a MOS transistor for each memory cell including a pair of first impurity regions formed in said semiconductor substrate and a first gate electrode formed on the semiconductor substrate between said pair of first impurity regions;

a MOS transistor for the peripheral circuit including a pair of second impurity regions formed in said semiconductor substrate and a second gate electrode formed on said semiconductor substrate between said pair of second impurity regions;

a first conductive layer connected to one of said first impurity regions of said MOS transistor for the memory cell;

a second conductive layer connected to the other one of said first impurity regions of said MOS transistor for the memory cell, to form a lower electrode of said capacitor;

a third conductive layer connected to one of said second impurity regions of said MOS transistor for the peripheral circuit and extending above at least a portion of said second gate electrode of said MOS transistor of the peripheral circuit; and

a fourth conductive layer connected to another one of said second impurity regions of said MOS transistor for the peripheral circuit, and extending above at least a portion of said second gate electrode of said MOS transistor for the peripheral circuit and over at least a portion of said third conductive layer.

5,486,713

SEMICONDUCTOR DEVICE HAVING A CAPACITOR

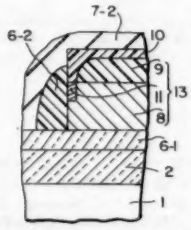
Kuniaki Koyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 177,865, Jan. 4, 1994, abandoned. This application May 26, 1995, Ser. No. 450,921

Claims priority, application Japan, Jan. 5, 1993, 5-000158

Int. Cl.[6] H01L *27/08;29/76;29/94;31/119*

U.S. Cl. 257—310 **9 Claims**



1. A semiconductor device comprising:

a semiconductor substrate;

an insulating film covering said semiconductor substrate;

first and second conductive layers formed on said insulating film apart from each other thereby forming respective sidewalls facing each other, each of said first and second conductive layers including a film made of metal whose oxide has an electrical conductivity;

a first dielectric film formed on said first conductive layer with a substantially same pattern as said first conductive layer;

a second dielectric film formed on said second conductive layer with a substantially same pattern as said second conductive layer, said first and second dielectric films thereby having top surfaces and respective sidewalls, the sidewalls facing each other, and each of said first and second dielectric films having a first dielectric constant;

a third dielectric film having a second dielectric constant that is smaller than said first dielectric constant and filling a space between said first and second conductive layers in contact with the sidewalls of said first and second conductive layers and further with the sidewalls of said first and second dielectric films, wherein said third dielectric film does not cover said top surfaces of said first and second dielectric films; and

a third conductive layer formed continuously to cover said first, second and third dielectric films in contact respectively with said first, second and third dielectric films, wherein said first conductive layer, said first dielectric film and a part of said third conductive layer constitutes a first capacitor, and said second conductive layer, said second dielectric film and another part of said third conductive layer constitutes a second capacitor which has one electrode connected in common to one electrode of said first capacitor through said third conductive layer.

5,486,714

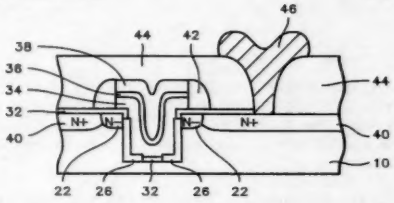
TRENCH EEPROM WITH TUNNEL OXIDE IN TRENCH

Gary Hong, Hsin-chu, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Division of Ser. No. 276,605, Jul. 18, 1994, Pat. No. 5,429,970. This application May 22, 1995, Ser. No. 445,939

Int. Cl.[6] H01L *27/115*

U.S. Cl. 257—321 **8 Claims**



1. The Flash EEPROM memory comprising:

a stacked polysilicon gate structure in a trench within a semiconductor substrate and extending above said semiconductor substrate;

source and drain regions on either side of said stacked polysilicon gate structure at the surface of said substrate;

a thin tunnel oxide layer overlying said source and drain regions, on the sidewalls of the upper portions of said trench contacting said source and drain regions, and at a small center portion of the bottom of said trench;

a thick gate oxide layer on the sidewalls and bottom of said trench not covered by said thin tunnel oxide layer;

a polysilicon floating gate at the base of said stacked polysilicon gate structure;

an interpoly dielectric layer overlying said polysilicon floating gate; and

a polysilicon control gate overlying said interpoly dielectric layer.

5,486,715

HIGH FREQUENCY MOS DEVICE

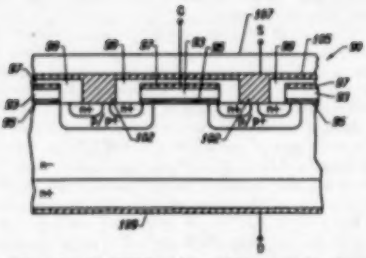
Nathan Zommer, Los Altos, Calif., assignor to IXYS Corporation, Santa Clara, Calif.

Continuation of Ser. No. 137,823, Oct. 15, 1993, abandoned. This application Dec. 1, 1994, Ser. No. 347,787

Int. Cl.[6] H01L *29/78;21/265*

U.S. Cl. 257—341 **30 Claims**

1. A power MOSFET device comprising:



a plurality of active MOS regions within a semiconductor substrate, each of said active MOS regions having a source region, channel region, and drain region;

a polysilicon layer overlying said semiconductor substrate, said polysilicon layer having a portion overlying at least each of said channel regions to form a common gate electrode;

a first metallization layer comprising aluminum having portion overlying said polysilicon layer overlying each of said channel regions;

an insulating layer on and in contact with said first metallization layer; and

a second metallization layer comprising a gate bus and a source bus overlying at least said insulating layer, said second metallization layer further comprising aluminum;

wherein said first metallization layer and said gate bus are common to each other through a gate contact opening in at least said insulating layer.

5,486,716

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH ELECTROSTATIC DAMAGE PROTECTION

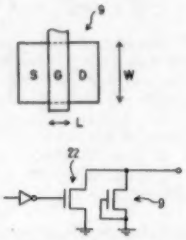
Yutaka Saito; Jun Osanai; Yoshikazu Kojima, and Masaaki Kamiya, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed May 8, 1992, Ser. No. 880,720

Claims priority, application Japan, May 14, 1991, 3-109443; Jul. 16, 1991, 3-175628; Jan. 21, 1992, 4-008670

Int. Cl.[6] H01L *23/62*

U.S. Cl. 257—360 **10 Claims**



1. A semiconductor integrated circuit device, comprising: an internal circuit area including an internal transistor of an insulating gate field effect type, the internal transistor having a channel portion formed with a length limited by a predetermined minimum length value; and a peripheral connection area including an N channel type peripheral transistor of the insulating gate fieid effect type for use in an external connection, an open-drain output portion and an open-drain output transistor electrically connected to the open-drain output portion, wherein the peripheral transistor is electrically connected to the open-drain output transistor and has a short channel portion formed with a shorter length than the predetermined minimum length value so that an electrostatic stress current applied to the semiconductor integrated circuit is released more efficiently by the peripheral transistor than by the internal transistor.

5,486,717

SRAM WITH SMALL PLANAR LAYOUT

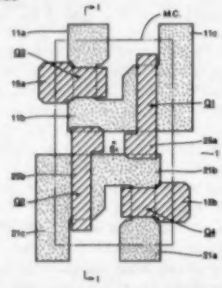
Nobuyuki Kokubo, and Kazuya Ikeda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 309,833

Claims priority, application Japan, Jan. 29, 1993, 5-272031

Int. Cl.[6] H01L *27/11*

U.S. Cl. 257—385 **23 Claims**



1. A semiconductor memory device including a static memory cell having an access transistor pair and a driver transistor pair in a memory cell region, comprising:

a semiconductor substrate having a main surface;

a first access transistor having a gate electrode layer formed on the main surface of said semiconductor substrate with a gate insulating film therebetween;

a second access transistor having a gate electrode layer formed on the main surface of said semiconductor substrate with a gate insulating film therebetween, said gate electrode layers of said first and second access transistors being formed from two portions of the same conductive layer, which portions are isolated from each other;

a first driver transistor having a gate electrode layer formed on the main surface of said semiconductor substrate with a gate insulating film therebetween;

a second driver transistor having a gate electrode layer formed on the main surface of said semiconductor substrate with a gate insulating film therebetween;

an insulating layer formed over and around said gate electrode layer of each of said transistors, and having a first contact hole reaching a top surface of said gate electrode layer of said first access transistor and a second contact hole reaching a top surface of said gate electrode layer of said second access transistor; and

a conductive layer formed on said insulating layer and connected to said gate electrode layers of said first and second access transistors via said first and second contact holes.

5,486,718

HIGH VOLTAGE PLANAR EDGE TERMINATION STRUCTURE AND METHOD OF MAKING SAME

Stephen Robb, Tempe, and Paul Groenig, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 270,281

Int. Cl.[6] H01L *23/58*

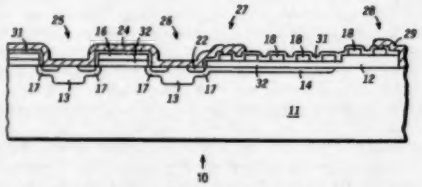
U.S. Cl. 257—630 **15 Claims**

11. A semiconductor structure having an edge termination feature comprising:

a semiconductor substrate of a first conductivity type;

a first doped region of a second conductivity type selectively formed in said semiconductor substrate to form a pn junction together with said semiconductor substrate, said first doped region having an impurity concentration higher than that of said semiconductor substrate;

a second doped region of the second conductivity type selectively formed in said semiconductor substrate and coupled with said first doped region, said second doped region form-



ing a pn junction together with said semiconductor substrate and having an impurity concentration lower than that of said first doped region;

an electrically insulating layer disposed on said semiconductor substrate so as to extend over said second doped region; and

a polysilicon layer disposed over said electrically insulating layer and over at least a portion of said second doped region, said polysilicon layer having a coil-shaped configuration and being electrically coupled at an inner portion to said first doped region and electrically coupled at an outer portion to said semiconductor substrate, and wherein said polysilicon layer does not make direct contact to said second doped region.

5,486,719

SEMICONDUCTOR DEVICE INCLUDING INSULATING FILM ARRANGEMENT HAVING LOW REFLECTANCE

Souichi Sugiura, Yamato; Hidehiro Watanabe, Tokyo, both of, Japan, and Seiko Yoshida, Fishkill, N.Y., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

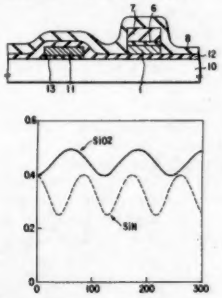
Filed Apr. 14, 1994, Ser. No. 227,519

Claims priority, application Japan, Apr. 15, 1993, 5-112194

Int. Cl.[6] H01L *23/58*

U.S. Cl. 257—641 **9 Claims**

1. A semiconductor device, comprising:



a semiconductor substrate;

a gate electrode insulatively spaced from said semiconductor substrate;

a wiring layer insulatively spaced from said semiconductor substrate;

a first insulating film formed only on said wiring layer, said first insulating film having a reflectance which is 25% or more;

a second insulating film formed only on said first insulating film, said second insulating film having a reflectance which is 25% or more and said first and second insulating films having a total reflectance of less than 25%; and

a third insulating film covering said gate electrode, said wiring layer, and said first and second insulating films.

5,486,720

EMF SHIELDING OF AN INTEGRATED CIRCUIT PACKAGE

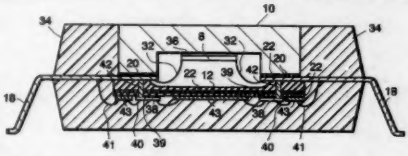
Oliver J. Kierse, County Clare, Ireland, assignor to Analog Devices, Inc., Norwood, Mass.

Filed May 26, 1994, Ser. No. 250,166

Int. Cl.[6] H01L *23/06;23/36;23/482*

U.S. Cl. 257—659 **25 Claims**

1. An electromagnetically shielded circuit package, comprising:



a leadframe having a plurality of lead fingers,

an electrically conductive heat sink disposed on said leadframe, said heat sink having a recess that faces said leadframe,

a ground connection for said heat sink,

a first electrically insulating layer between said heat sink and said leadframe,

an electrically conductive layer disposed on a side of said leadframe facing away from said heat sink and, together with said heat sink, forming an electromagnetic field shielded enclosure,

a ground connection for said electrically conductive layer,

a second electrically insulating layer between said electrically conductive layer and said leadframe,

a first electrical device disposed within said enclosure in thermal communication with said heat sink and shielded from outside electromagnetic fields by said heat sink and electrically conductive layer,

a third electrically insulating layer on a side of said electrically conductive layer that faces away from said heat sink,

electrically conductive tracks on said third electrically insulating layer, said tracks in electrical communication with said lead fingers,

at least one other electrical device disposed outside of said enclosure and attached to said third electrically insulating layer, said at least one other electrical device having leads in electrical communication with said electrically conductive tracks, and being shielded from electromagnetic energy emitted from said first electrical device within said enclosure, and

an electrically insulating molding material encapsulating said heat sink, leadframe, electrically conductive layer, electrically insulating layers, and all of said electrical devices.

5,486,721

LEAD FRAME FOR INTEGRATED CIRCUITS

Günter Herklotz, Bruchköbel; Heinz Förderer, Grosskrotzenburg, and Thomas Frey, Hanau, all of, Germany, assignors to W.C. Heraeus GmbH, Hanau, Germany

Filed Mar. 31, 1994, Ser. No. 221,175

Claims priority, application Germany, Apr. 10, 1993, 43 11 872.0

Int. Cl.[6] H01L *23/48;23/52;29/40;* **H05K** *5/02*

U.S. Cl. 257—666 **20 Claims**

1. Lead frame for an integrated circuit, said lead frame comprising

a metal base element,

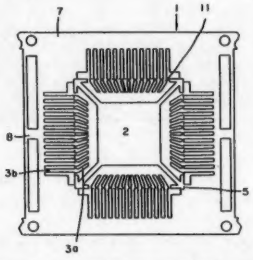
an outer layer of palladium, and

an intermediate layer consisting of a nickel-phosphorus alloy between said base element and said outer layer, said intermediate layer having a phosphorus content of 1–30 wt %.

5,486,722
LEAD FRAME HAVING SMALL PITCH BETWEEN OUTER LEADS

Naohumi Sato, and Yasuhiro Yanagisawa, both of Tokyo, Japan, assignors to Sumitomo Metal Mining Company, Limited, Tokyo, Japan

Filed May 3, 1994, Ser. No. 237,176
Claims priority, application Japan, May 11, 1993, 5-132918; Mar. 23, 1994, 6-076462
Int. Cl.[6] H01L *23/495;23/28*
U.S. Cl. 257—666 **3 Claims**



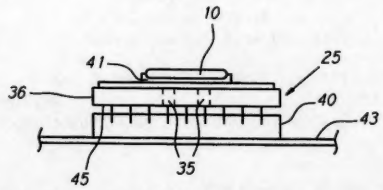
1. A lead frame for a semiconductor device, comprising a die pad disposed at a central area of the lead frame for mounting a semiconductor chip, and a plurality of leads surrounding said die pad, each lead being divided into an inner lead portion which is to be encapsulated with a resin material and an outer lead portion, which is not to be encapsulated by said resin, and a mold line defined at the intersection of the inner and outer portions of each lead,

said outer lead portions along each side of said frame being spaced from one another along the respective side of said frame, said inner lead portions being spaced from one between adjacent inner lead portions, each lead having a portion of greatest width adjacent said mold line and including side edge portions which continously taper outwardly away from one another toward said mold line in an area adjacent said mold line so that each of said spaces in an area adjacent said mold line, continuously tapers inwardly to a point adjacent said mold line to form a gap between leads of less than 0.15 mm at said mold line to substantially prevent flowable resin material supplied to said central area from flowing past said mold line.

5,486,723
PACKAGED INTEGRATED CIRCUIT ADD-ON CARD

Abraham C. Ma, Milpitas, and Paul Y. J. Hsueh, Concord, both of Calif., assignors to MA Laboratories, Inc., San Jose, Calif.

Continuation of Ser. No. 68,250, May 27, 1993, Pat. No. 5,362,985. This application Nov. 7, 1994, Ser. No. 335,131
The portion of the term of this patent subsequent to Nov. 8, 2011, has been disclaimed.
Int. Cl.[6] H01L *23/02*
U.S. Cl. 257—707 **11 Claims**



1. An add-on card which may be used to connect a land gate array packaged integrated circuit to an integrated circuit socket comprising:

a board having a bonding surface and a pin surface, said board having a first board layer with containing said bonding surface and a second board layer containing said pin surface;

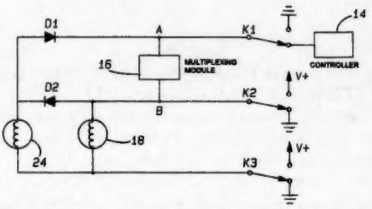
an array of rows and columns of mounting pads disposed on said bonding surface of said board, said plurality of mounting pads having greater surface area than solder points on the land gate array packaged integrated circuit that will be bonded thereto; and

a plurality of pins fastened to said pin surface of said circuit board, said plurality of pins arranged so that said plurality of pins fit into a pin grid array socket, each of said plurality of pins electrically connected to said one of said mounting pads via circuitries between said first board layer and said second board layer.

5,486,724
SYSTEM FOR CONTROL OF ACTUATORS AND SWITCHES BY A REMOTELY LOCATED MICROCONTROLLER USING A TWO BUSS SYSTEM

Pierre Periou, Cergy Pontoise; Xavier Bonnefond, Paris, both of, France; Dennis A. Kramer, Troy, and Mark E. Malinowski, Farmington Hills, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 15, 1992, Ser. No. 822,186
Int. Cl.[6] G05D *3/00*
U.S. Cl. 307—10.1 **24 Claims**



1. A vehicular actuator interface circuit for coupling at least one electromechanical actuator and at least one switching mechanism to a controller of the type which controls application of operating power to the actuator in response to changes in state of said switching mechanism, comprising:

a periodic signal having a cycle including a low and a high condition, said periodic signal generated by said controller and communicated to said switching mechanism by said interface circuit;

said switching mechanism including means for loading said interface circuit in response to changes in state of said switching mechanism; and

said controller including means to detect a coincidence of said high condition of said periodic signal and loading of said interface circuit to thereby determine the state of said switching mechanism and supplying power to said actuator in response to changes in state of said switching mechanism.

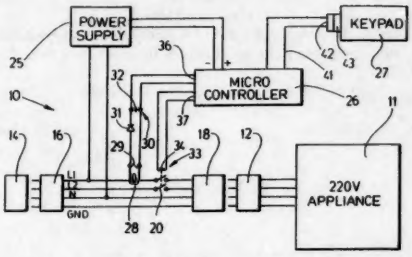
5,486,725
SECURITY POWER INTERRUPT

Daniel J. Keizer, 38 First Avenue, Schumacher, Ontario, Canada; Steven A. Lax, 193 Crestwood Road, Toronto, Ontario, Canada, and Robert K. Muylwyk, 54 Amelia Street, Toronto, Ontario, Canada

Filed Dec. 27, 1993, Ser. No. 173,046
Int. Cl.[6] H01H *71/24*
U.S. Cl. 307—116 **12 Claims**

1. For interrupting power to an electrical appliance having a first load which draws a current below a preset current threshold and a second load which draws a current above the preset current threshold, a device comprising

means for connecting the device to an electrical power supply,



means for supplying electrical power to the appliance connected to both the first load and the second load through a single switch,

means for monitoring an electric current drawn by the appliance and comparing the electric current to the preset current threshold,

the switch being controlled by means for selectively interrupting power to the appliance in an interrupt mode in which the device supplies power to the appliance to power the first load and when the second load is activated so that the current drawn by the appliance exceeds the current threshold the means for interrupting power opens the switch to thereby interrupt power to the appliance,

the means for interrupting power to the appliance being responsive to entry of an authorization signal for switching the device from the interrupt mode to an operational mode in which the device supplies power to the appliance regardless of the current drawn by the appliance, and

unlocking means for transmitting the authorization signal to the means for interrupting power to the appliance.

5,486,726

POWER-SUPPLY CONTROL SYSTEM OF PERIPHERAL EQUIPMENT OF COMPUTER

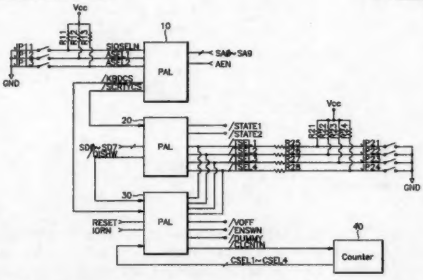
Heejo Kim, Seoul; Jongyong Leem, Kyungki; Bongrak Choi, Seoul; Kyungsang Lee, and Kyungseol Min, both of Kyungki, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Aug. 11, 1993, Ser. No. 104,202

Claims priority, application Rep. of Korea, Aug. 13, 1992, 92-14590; Aug. 13, 1992, 92-15238; Mar. 4, 1993, 93-3116

Int. Cl.[6] H01H *35/00*

U.S. Cl. 307—120 **5 Claims**



1. A power-supply control system for a peripheral equipment of a computer comprising:

first switching means for generating a serial port sensing signal and an address selecting signal which is user adjustable;

input-output sensing means for both determining which input and output means are being used by testing a serial port sensing enable signal, an address selecting signal, an address signal and an address enable signal, and for outputting a signal which senses the use of an input-output means;

internal-operation sensing means for both generating a delay-time signal and a hardware disable signal, and for sensing the internal state and operation of a computer from a chip selecting signal of the input-output sensing means, a data signal, said delay-time signal and a state signal;

second switching means for enabling an adjustment of said delay-time signal by the user;

a counter for outputting a current counting value, for performing a continuous counting operation, and for resetting in response to a counter clear signal; and

controlling means for outputting a power controlling signal to an external input-output means based on the use of the input-output means of said input-output sensing means, the delay-time signal of said internal-operating sensing means, the hardware disable signal, a reset signal of a system bus, a signal for reading the input and output means, and the counting value of said counter.

5,486,727

LINEAR ACCELERATOR

Götz Heidelberg, Starnberg; Peter Ehrhart, München; Gerhard Reiner, Pähl, and Andreas Gründl, München, all of, Germany, assignors to Magnet-Motor Gesellschaft MbH, Starnberg, Germany

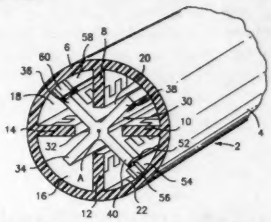
PCT No. PCT/EP92/01530, § 371 Date Jan. 6, 1994, § 102(e) Date Jan. 6, 1994, PCT Pub. No. WO93/01645, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 7, 1992, Ser. No. 178,053

Claims priority, application Germany, Jul. 8, 1991, 41 22 601.1

Int. Cl.[6] H02K *41/02;* **H01F** *7/06*

U.S. Cl. 310—12 **18 Claims**



1. A linear accelerator comprising a longitudinal stator defining a linear path of movement and having a plurality of stator conductors; a runner accelerable along the path of movement, said runner having an plurality of runner conductors; said stator and runner conductors being disposed symmetrically about a plane perpendicular to the path of movement with respect to an axis parallel to the path of movement; and said stator conductors being formed as stator coils which are aligned so as to create a magnetic field radially surrounding said axis in symmetric fashion; and a plurality of stator components disposed along said path of movement, each of said stator components being provided with a separate power supply.

5,486,728

MICROMOTOR

Hideo Hirama, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

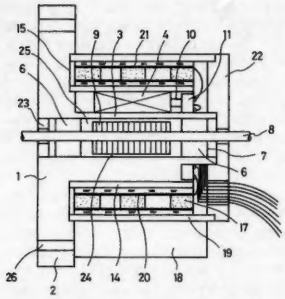
Filed Aug. 13, 1993, Ser. No. 106,419

Claims priority, application Japan, Aug. 25, 1992, 4-226276

Int. Cl.[6] H02K *5/12;9/00;9/197*

U.S. Cl. 310—40 MM **8 Claims**

1. A micromotor comprising: a cylindrical rotor casing provided with a central through hole; a rotor comprised of a cylindrical, magnetic rotor block fixed on a rotor shaft and inserted in the central through hole of the rotor casing; first and second bearings supporting the rotor shaft for rotation and being fitted, respectively,



in opposite ends of the central through hole of the rotor casing and defining a sealed rotor chamber therebetween; stator coils attached to the outer circumference of the rotor casing; a stator casing joined to the rotor casing coaxially with the rotor so as to cover the stator coils; a magnetic fluid filled in the sealed rotor chamber between the first and second bearings between which is disposed the magnetic rotor block; heat-dissipating means disposed around the stator coils for dissipating heat generated by the stator coils, magnetic fluid, and first and second bearings during operation of the micromotor, the heat-dissipating means comprising a plurality of Peltier elements disposed circumferentially around the stator coils for absorbing heat by the Peltier effect; and a tubular member encircling the rotor casing at least in the region between the first and second bearings and defining an annular space between the tubular member and rotor casing, the stator coils being disposed interiorly of the tubular member in the annular space and the heat-dissipating means being disposed exteriorly of the tubular member, the Peltier elements being disposed at axially-spaced locations along the tubular member and at circumferentially-spaced locations around the tubular member.

5,486,729

METHOD AND APPARATUS FOR CONTROLLING A MAGNETIC BEARING

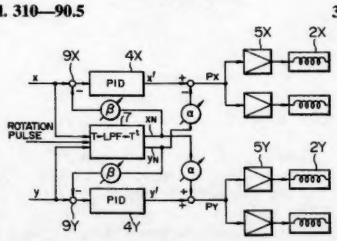
Osami Matsushita; Mitsuho Yoneyama; Naohiko Takahashi, all of Ibaraki; Yasuo Fukushima, Tsuchiura; Minoru Hiroshima, Ushiku; Tadashi Kaneki, Tsuchiura; Yoshiaki Abe, and Naofumi Sakanashi, both of Ibaraki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 5, 1993, Ser. No. 26,760

Claims priority, application Japan, Mar. 9, 1992, 4-086027; Nov. 4, 1992, 4-295258

Int. Cl.[6] H02K *7/09*

U.S. Cl. 310—90.5 **33 Claims**



1. A method of controlling a magnetic bearing, said method comprising:

providing an ABS control and N-cross control in coaction.

5,486,730

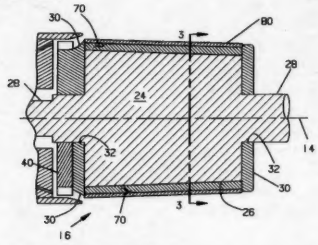
ROTOR ASSEMBLY

George A. Ludwig, and David G. Teraji, both of San Diego, Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.

Filed Mar. 18, 1993, Ser. No. 33,483

Int. Cl.[6] H02K *21/12*

U.S. Cl. 310—156 **12 Claims**



1. A rotor assembly comprising:

a shaft having a first end portion and a second end portion and having a frustoconical surface defined thereon interposed the first and second end portions;

a plurality of magnets being attached to the frustoconical surface forming a generally frustoconical outer configuration wherein said plurality of magnets have a thickness at a larger end being less than a thickness at a smaller end of the frustoconical outer configuration;

a cover having a preestablished inner frustoconical surface being in contact with the magnets; and

a pair of end flanges being attached to the shaft.

5,486,731

SINUSOIDALLY DISTRIBUTED WINDING METHOD SUITABLE FOR A DETECTOR WINDING

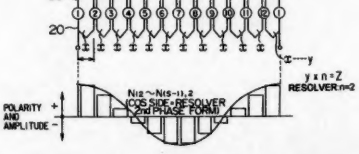
Koichi Masaki; Yoshinao Fukuzawa; Kanji Kitazawa; Takanobu Azuma; Naohiro Naganuma, and Tetsuo Hosoda, all Iida, Japan, assignors to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1993, Ser. No. 38,463

Claims priority, application Japan, Jan. 27, 1992, 4-288798

Int. Cl.[6] H02K *3/00*

U.S. Cl. 310—180 **1 Claim**



1. In a sinusoidally distributed winding suitable for a detector winding wherein n-phase winding groups are wound on a ring core having a given number of alternating tooth portions and slots disposed along its inner diameter side so that a plurality of one-phase winding groups produce a 2P polar and sinusoidally distributed magnetic flux distribution of said n-phase winding groups, the improvement comprising a number of serially connected winding groups corresponding to the number of said slots to provide said plurality of one-phase winding groups, said winding groups being wound at one-slot pitch intervals, and a plurality of said one-phase winding groups providing said n-phase winding groups, whereby a 2P polar and n-phase sinusoidally distributed magnetic flux is

provided, a number of winding turns of said one-phase winding groups in each of said slots being determined by the following formula:

$$N_{k1}=\frac{W\sin\left[2\pi P/S\left\{(k-1)+\frac{1}{2}\right\}\right]}{\sum_{i=1}^{S}\sin\left[2\pi P/S\left\{(i-1)+\frac{1}{2}\right\}\right]}$$

$$N_{k2}=\frac{W\sin\left[2\pi P/S\left\{(k-1)+\frac{1}{2}\right\}+\frac{2\pi}{n}\right]}{\sum_{i=1}^{S}\sin\left[2\pi P/S\left\{(i-1)+\frac{1}{2}\right\}+\frac{2\pi}{n}\right]}$$

$$\vdots$$

$$N_{k(n)}=\frac{W\sin\left[2\pi P/S\left\{(k-1)+\frac{1}{2}\right\}+\frac{2\pi(n-1)}{n}\right]}{\sum_{i=1}^{S}\sin\left[2\pi P/S\left\{(i-1)+\frac{1}{2}\right\}+\frac{2\pi(n-1)}{n}\right]}$$

where

S is a variable integer representing said number of slots;

k is a variable integer representing a given slot, k being between one and said number of slots;

n is a variable integer representing a number of phases;

P is a variable integer representing a number of magnetic poles in said detector winding;

W is a variable integer representing a total number of turns (the sum of the windings wound at each slot in one phase when i=1 to S); and

$N_{k\ (n)}$ is a variable integer representing the respective number of turns of the windings at the k-th slot in the n-th winding group of said n-phase winding groups.

5,486,732

SLIP RING UNIT FOR FITTING TO AN ALTERNATOR, ESPECIALLY FOR A MOTOR VEHICLE

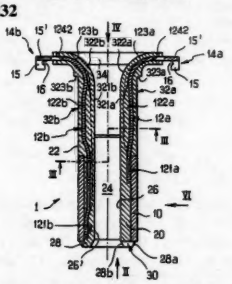
Patrick Rondier, Montmagny, France, assignor to Valeo Equipements Electriques Moteur, Creteil, France

Filed Sep. 21, 1994, Ser. No. 304,361

Claims priority, application France, Sep. 16, 1993, 93 11041

Int. Cl.[6] H02K *13/02*

U.S. Cl. 310—232 **9 Claims**



1. An electrical terminal connection comprising a wire having a wire end and a connecting element secured to the wire end, the connecting element comprising two lugs in facing relationship and defining a channel between them for receiving the wire end, and a connecting portion joining the lugs together and defining a base of the said lugs being arranged to be bent towards each other to grip the wire end between them, wherein at least one lug defines a lateral edge, the lateral edge having a slot formed therein close to the connecting portion, the wire end comprising a first wire portion extending within the channel, a second wire portion extending outside the channel, and a bent wire portion, bent through approximately 180°, joining said first and second wire portions together and received in said slot.

5,486,733

BONDING APPARATUS

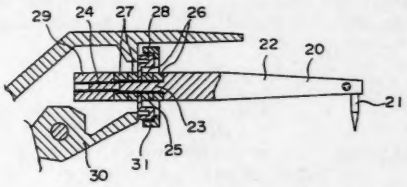
Nobuto Yamazaki, Higashi, and Ryuichi Kyomasu, Kodaira, both of, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Continuation of Ser. No. 172,028, Dec. 22, 1993, abandoned. This application Dec. 28, 1994, Ser. No. 365,055

Claims priority, application Japan, Dec. 24, 1992, 4-357385

Int. Cl.[6] H03H *9/05*

U.S. Cl. 310—323 **3 Claims**



1. A bonding apparatus for a semiconductor device processing comprising a bonding arm, an ultrasonic horn mounted to said bonding arm, a bonding tool provided at one end of said ultrasonic horn and a vibration-generating source provided at an other end of said ultrasonic horn, and wherein said bonding apparatus further comprises a horn support that is used for mounting said ultrasonic horn to said bonding arm, said horn support comprising vibration-generating source attachment shafts on both sides and threaded portions formed at end portions of said attachment shafts, said vibration-generating sources are provided on said attachment shafts and located on both sides of said horn support, and one of said threaded portions is screw connected to said ultrasonic horn.

5,486,734

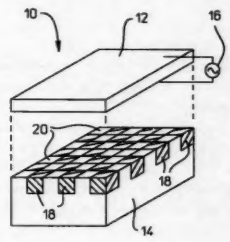
ACOUSTIC TRANSDUCER USING PHASE SHIFT INTERFERENCE

Mir S. Seyed-Bolorforosh, 1704 Oak Creek Dr., Apt. 307, Palo Alto, Calif. 94309

Continuation of Ser. No. 198,727, Feb. 18, 1994, abandoned. This application Feb. 3, 1996, Ser. No. 382,829

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—327 **11 Claims**



1. A transducer device for transmitting acoustic waves in response to an electrical signal comprising:

a piezoelectric element having first and second surfaces and a first acoustic impedance, and further having an operating frequency; and

means having an interface with said first surface for establishing a desired pattern of wave interference for acoustic waves that are originally directed toward said first surface and then redirected toward said second surface;

said means including first and second sections having dissimilar acoustic impedances, said first acoustic impedance being more closely matched to said acoustic impedance of said second sections than to said acoustic impedance of said first sections;

said first and second sections having generally planar proximal sides at said interface with said first surface of said piezoelec-

tric element, said second sections having generally planar distal sides opposite to said proximal sides, each said distal side being parallel to said proximal side and separated therefrom by a distance equal to an integral odd multiple of a one-quarter wavelength of said operating frequency of said piezoelectric element;

whereby said desired pattern of wave interference is formed such that acoustic energy reflected at said proximal sides of said first section is substantially 180° out of phase with respect to acoustic energy reentering said piezoelectric element after being reflected at said distal sides of said second section.

5,486,735

ELECTRON GUN WITH IMPROVED WITHSTAND VOLTAGE FOR COLOR-PICTURE TUBE

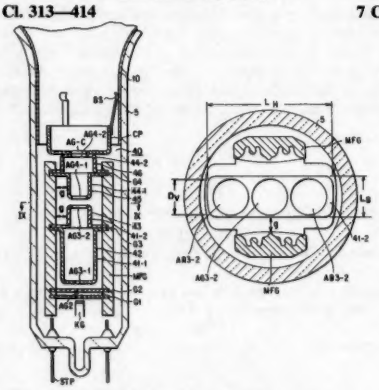
Eiji Kamohara, Fukaya; Shigeru Sugawara, Saitama, and Junichi Kimiya, Fukaya, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 1, 1993, Ser. No. 143,646

Claims priority, application Japan, Nov. 2, 1992, 4-294374

Int. Cl.[6] H01J *29/51*

U.S. Cl. 313—414 **7 Claims**



1. A color cathode ray tube comprising:

an electron gun assembly for generating in-line electron beams;

a phosphor screen for emitting light rays when said electron beams land thereon;

a vacuum envelope having a face where said phosphor screen is formed and which accommodates said electron gun assembly;

deflecting means for deflecting said electron beams in vertical and horizontal directions in said vacuum envelope;

said electron gun assembly having an electron-beam generating section, for generating a plurality of in-line electron beams, and a main electronic lens section for converging said plurality of in-line electron beams, generated by said electron-beam generating section, on said phosphor screen,

said main electronic lens section including a plurality of grids each having electron-beam through holes and securely supported by a plurality of insulating supports, at least one of said grids having a portion with a substantially rectangular cross section for commonly enclosing said plurality of in-line electron beams and a face having electron-beam through holes formed at one or more ends and substantially perpendicular to said portion having a substantially rectangular cross section, said substantially rectangular portion having an outside length L_H in a long-axial direction and an outside length L_S in a short-axial direction such that a ratio of said outside length L_H to said outside length L_S, L_H/L_S, is

$$.5<L_H/L_S<4.4$$

and a ratio of said outside length L_S in said short-axial direction to a length D_V of said electron-beam through holes in the same short-axial direction, L_S/D_V, is

$$.0<L_S/D_V<2.1.$$

5,486,736

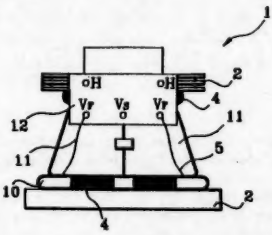
DEFLECTION YOKE

Gi W. Lee, Suwon; Sung Y. Lim, Seoul, and In J. Yoon, Suwon, all of, Rep. of Korea, assignors to Samsung Electro-Mechanics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 22, 1994, Ser. No. 216,131

Int. Cl.[6] H01J *29/70*

U.S. Cl. 313—440 **2 Claims**



1. In a deflection yoke having a coil separator for forming the shape of said deflection yoke, a pair of horizontal deflection coils on the inner side of said coil separator for generation a deflection magnetic field to horizontally deflect electron beams, a pair of vertical deflection coils on the outer side of said coil separator for generation a deflection magnetic field to vertically deflect said electron beams, each of said vertical deflection coils having a screen-bent portion at its front part and a neck bent portion at its rear part, and a pair of ferrite cores of a magnetic material mounted to wrap the outer portion of said vertical deflection coils to increase a deflection force, improvements to said deflection yoke comprising:

non-magnetic conductors respectively attached to said screen-bent portions of said pair of vertical deflection coils for externally wrapping said vertical deflection coils, and allowing stray capacitance generated between said horizontal deflection coils and vertical deflection coils and between said vertical deflection coils and said pair of ferrite cores to be conducted; and

lead lines simultaneously connected to said non-magnetic conductors and terminals at ends of said vertical deflection coils for allowing said stray capacitance conducted by said non-magnetic conductors to be passed to ground.

5,486,737

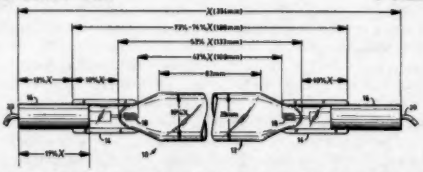
HEAVILY LOADED DOUBLE-ENDED ARC LAMP

David M. Hrubowchak, Litchfield, N.H., and Nanu Brates, Malden, Mass., assignors to Osram Sylvania Inc., Del.

Filed Apr. 12, 1994, Ser. No. 226,807

Int. Cl.[6] H01J *61/30*

U.S. Cl. 313—634 **6 Claims**



1. A double-ended arc lamp having an overall length equal to X; an arc chamber having a volume of about 56 cc and which is cylindrical for a greater part of its length; an arc length equal to

about 42%X; an overall arc chamber length of about 50%X; a maximum arc chamber inside diameter of about 10%X; and a pair of press seals each having a length of about between 10%X to 11%X.

5,486,738

ELECTROLUMINESCENT DEVICE

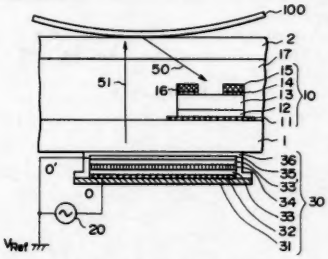
Toshihiro Saika, Zama; Hidemasa Mizutani, Sagamihara; Noriyuki Kaifu, Hachioji, and Toshio Kameshima, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 934,326, Aug. 25, 1992, Pat. No. 5,384,456. This application Aug. 23, 1994, Ser. No. 294,361

Claims priority, application Japan, Aug. 29, 1991, 3-242461; Aug. 30, 1991, 3-244159

Int. Cl.[6] G09G *3/10*

U.S. Cl. 315—169.3 **3 Claims**



1. An electroluminescent device comprising a first electrode, a second electrode and an electroluminescence emission zone, the electroluminescence emission zone being made of a first electroluminescence emission layer, a second electroluminescence emission layer, and a transparent electrode which is interposed between the first electroluminescence emission layer and the second electroluminescence emission layer, at least either the first electrode or the second electrode being a transparent electrode, whereby the first electroluminescence emission layer and the second electroluminescence emission layer emit light by applying a driving voltage to the transparent electrode with both the first electrode and the second electrode connected to a power supply for a reference voltage.

5,486,739

BALLASTING SYSTEM FOR FLUORESCENT LAMPS HAVING IMPROVED ENERGY TRANSFER

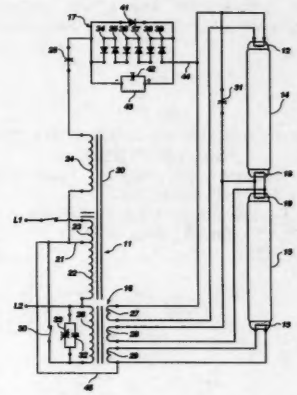
Gary D. Roberts, Riverton, Utah, assignor to Remtech, L.C., Lindon, Utah

Continuation-in-part of Ser. No. 125,815, Sep. 24, 1993, and a continuation-in-part of Ser. No. 215,257, Mar. 21, 1994. This application May 13, 1994, Ser. No. 242,417

Int. Cl.[6] H05B *41/16*

U.S. Cl. 315—277 **12 Claims**

1. A ballasting system for fluorescent lamps which includes an elongated laminated iron core having a magnetic shunt which produces low leakage reactance and a narrow range of harmonics, a cathode heating transformer which includes a first winding and three supplementary windings wound together on said core, a low leakage reactance ballasting transformer which includes a main winding on said core adapted to be connected across an a.c. power line, a tap on said main winding dividing it into a primary winding and a tertiary winding, a secondary winding positioned on said core over the magnetic shunt, and means for tuning the combination of the tertiary winding and the effective magnetic flux under load in said secondary winding to the primary winding at the frequency of the a.c. power line.



5,486,740

LIGHTING CIRCUIT FOR VEHICULAR DISCHARGE LAMP HAVING DC/AC CONVERTER

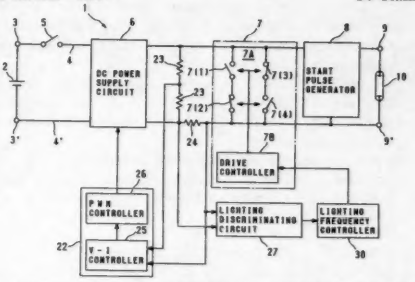
Masayasu Yamashita, and Atsushi Toda, both of Shimizu, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1994, Ser. No. 346,918

Claims priority, application Japan, Nov. 30, 1993, 5-323297

Int. Cl.[6] G05F *1/00*

U.S. Cl. 315—308 **14 Claims**



1. A lighting circuit for a vehicular discharge lamp, comprising:

a DC-AC converter for converting a DC voltage from a DC power supply circuit to an AC voltage with a rectangular waveform and supplying said AC voltage to a discharge lamp;

a start pulse generator for generating a start pulse to said discharge lamp, superimposing said start pulse on an output of said DC-AC converter and supplying a resultant pulse to said discharge lamp, said start pulse generator including a transformer having a secondary winding connected to a power supply line connecting an output terminal of said DC-AC converter to said discharge lamp and a primary winding to which a capacitor and a self-breakdown switch element are connected in series, whereby a timing at which said start pulse is generated by closing of the series circuit of said self-breakdown switch element, said primary winding and said capacitor, caused when said self-breakdown switch element yields, is associated with a specific phase of said rectangular wave from said DC-AC converter;

a lighting discriminating circuit for discriminating an ON status or OFF status of said discharge lamp; and

lighting frequency control means for changing a frequency of said rectangular wave from said DC-AC converter in such a manner that a frequency of said rectangular wave output from said DC-AC converter at a time said OFF status of said discharge lamp is discriminated by said lighting discriminating circuit becomes lower than a frequency of said rectangular

wave at a time said ON status of said discharge lamp is discriminated by said lighting discriminating circuit.

5,486,741

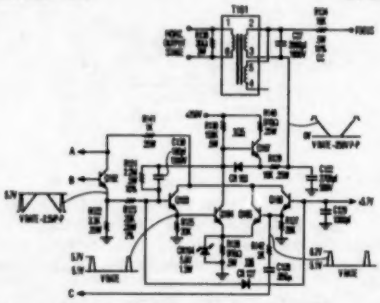
WAVEFORM CORRECTION CIRCUIT FOR DYNAMIC FOCUS AMPLIFIER

John B. George, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 3, 1994, Ser. No. 285,579

Int. Cl.[6] H01J *29/58*

U.S. Cl. 315—382 **14 Claims**



1. A dynamic focus amplifier, comprising:

means for generating a vertical rate sawtooth waveform;

first means responsive to said sawtooth waveform for generating at said vertical rate a modulating waveform having a desired component of a given shape during trace intervals and an undesired time compressed version of said given shape during retrace intervals;

second means responsive to said sawtooth waveform for generating a pulse waveform at said vertical rate, substantially corresponding in width and phase to a vertical retrace blanking waveform; and,

means for combining said modulating waveform and said pulse waveform to remove said undesired time compressed version of said given shape from said modulating waveform.

5,486,742

EASILY STARTED DC MOTOR APPARATUS

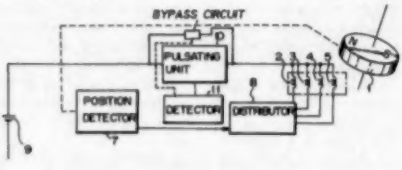
Hiroyuki Chino; Toshiya Akasaka, and Minoru Iwata, all of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation of Ser. No. 940,230, Sep. 3, 1992, abandoned. This application Jan. 21, 1994, Ser. No. 183,775

Claims priority, application Japan, Sep. 17, 1991, 3-265250

Int. Cl.[6] H02P *6/02*

U.S. Cl. 318—254 **6 Claims**



1. A DC motor comprising:

a rotary member for rotating about an axis;

a stationary member having a pluarlity of coils;

a position setecting means for detecting a pluarlity of positions of said rotary member as said rotary member rotates about said axis;

a DC current distributing means responsive to the output of said position detecting means for sequentially swithcing DC current supplied to said plurality of coils;

a pulsating means for pulsating the DC current flowing through at least one of said plurality of coils selected on the basis of a position of said rotary member detected by said position detector during a period that said DC current is being supplied to said at least one coil; and

wherein, during start-up of the motor, the DC current is pulsed in a timed sequence such that a driving force due to the DC current coincides with a back-and-forth swing of the rotary member resulting from the inertial force of the rotary member when the DC current pulses are supplied thereto.

5,486,743

INVERTER AND AIR CONDITIONER CONTROLLED BY THE SAME

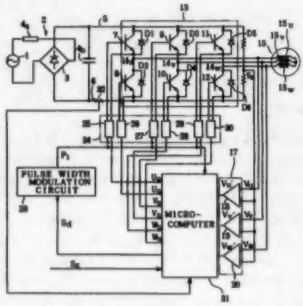
Kazunobu Nagai, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Nov. 16, 1993, Ser. No. 153,525

Claims priority, application Japan, Nov. 19, 1992, 4-310007; Aug. 24, 1993, 5-209191

Int. Cl.[6] H02P *6/08*

U.S. Cl. 318—439 **13 Claims**



1. An inverter comprising:

a switching circuit including a plurality of switching elements sequentially energizing windings of a plurality of phases of an electric motor;

a pulse width modulation circuit for obtaining a pulse width modulated signal;

electrical quantity detecting means for detecting a quantity of electricity supplied to the switching circuit, thereby generating an electrical quantity signal;

position detecting means for detecting a rotational position of a rotor of the motor, thereby providing information about the rotational position of the rotor;

energization signal generating means for generating an energization signal at a time according to a commutation timing necessary for the switching circuit on the basis of the information about the rotational position of the rotor, the energization signal generating means comprising means for obtaining a reference commutation timing from the information about the rotational position of the rotor, electrical quantity comparing means for sequentially sampling the electrical quantity signals generated by the electrical quantity detecting means to thereby obtain a mean electrical quantity value and comparing the mean electrical quantity value with a last mean electrical quantity value, and compensation means for compensating the commutation timing so that the commutation timing corresponds to a point of time preceding the reference commutation timing by a predetermined compensation period of time, the compensation means changing the predetermined compensation time period in accordance with the result of comparison by the electrical quantity comparing means; and

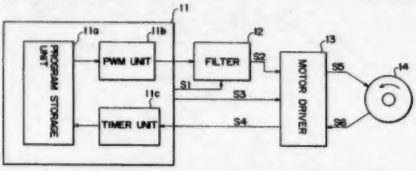
drive means synthesizing the energization signal and the pulse width modulated signal for driving each switching element.

5,486,744

SERVO DEVICE FOR SPINDLE MOTOR

Yusuke Watanabe, Isehara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 16, 1993, Ser. No. 18,926
Claims priority, application Japan, Feb. 20, 1992, 4-070150
Int. Cl.[6] G11B *19/247*
U.S. Cl. 318—560 **16 Claims**



1. A servo device for servo controlling a spindle motor, comprising:

means for generating a signal with at least two cycles during one full rotation of a rotator in said spindle motor in accordance with a rotational movement of said rotator;

means for measuring a period for at least one cycle in one full rotation of said rotator;

means for storing at least one target period corresponding to said measured period for said at least one cycle in one rotation of said rotator;

means for comparing said respective measured period with said corresponding target period stored in said storing means; and

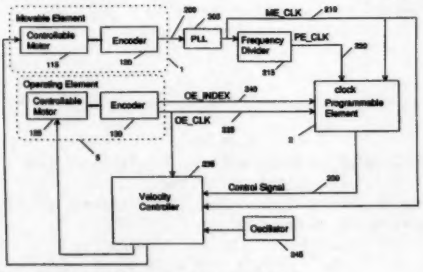
speed controlling-means for controlling a rotational speed of said rotator in response to a result of said comparing means.

5,486,745

METHOD AND APPARATUS FOR SYNCHRONIZING SYSTEM OPERATIONS USING A PROGRAMMABLE ELEMENT

Ralph S. Hanseler, Andover, and Michael D. Healy, Boston, both of Mass., assignors to Miles Inc., Wilmington, Mass.

Filed Oct. 5, 1993, Ser. No. 131,726
Int. Cl.[6] G11B *5/596;* **G05B** *11/18*
U.S. Cl. 318—561 **13 Claims**



1. A synchronization apparatus comprising;

a movable element;

an operating element;

means for generating a first reference signal corresponding to an operational position of said movable element;

means for generating a second reference signal corresponding to an operational characteristic of said operating element; and

a programmable element, including a clock input for receiving said first reference signal and a data input for receiving said second reference signal, for producing a synchronization control signal in response to said first and second reference signals; and

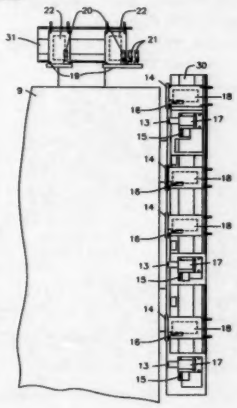
means, responsive to said synchronization control signal, for synchronizing the operational characteristic of said operating element with the operational position of said first movable element.

5,486,746

POSITIONING RULE STOPPER APPARATUS IN A NUMERICAL CONTROL ROUTER

Nobuyoshi Suzuki, Shizuoka, Japan, assignor to Heian Corporation, Shizuoka, Japan

Filed Oct. 20, 1993, Ser. No. 140,583
Claims priority, application Japan, Jan. 20, 1992, 4-306514
Int. Cl.[6] B23Q *1/18*
U.S. Cl. 318—569 **3 Claims**



1. A positioning rule stopper apparatus for use in a numerical control router, comprising:

a supporting bed;

a first rail mounted on the supporting bed;

a second rail mounted on the supporting bed and oriented at a right angle to said first rail;

a head structure provided with a process head having a motor with a rotary shaft on which a tool can be fixed, said head structure being movably mounted on the first rail;

a suction table mounted on the second rail for holding a sacrifice board and a process board on the sacrifice board, said suction table being movable on said second rail at a right angle to movement of the head structure on the first rail, said suction table having at least one short outer side and at least one long outer side;

a first stopper holder fixed to the supporting bed at one short outer side of the suction table;

a plurality of first rule stoppers for the sacrifice board and the process board in common;

first cylinder means mounted on said first stopper holder for moving said rule stoppers to position one side of the sacrifice board and the process board with respect to the suction table;

first confirming contact limit switches mounted on the first rule stoppers for confirming the position of said one side of the sacrifice board and the process board;

a second stopper holder fixed to the supporting bed at one longer outer side of the suction table;

a plurality of second rule stoppers for the sacrifice board;

second cylinder means mounted on said second stopper holder for moving said second rule stoppers to position another side of the sacrifice board with respect to the suction table; and

second confirming contact limit switches engaged with the second rule stoppers for confirming the position of said another side of the sacrifice board;

a plurality of third rule stoppers for the process board;

third cylinder means mounted on said second stopper holder for moving said third rule stoppers to position another side of the process board with respect to the suction table; and

third confirming contact limit switches engaged with the third rule stoppers for confirming the position of said another side of the process board; and

said second cylinder means and said third cylinder means are alternately mounted on the second stopper holder at different heights.

5,486,747

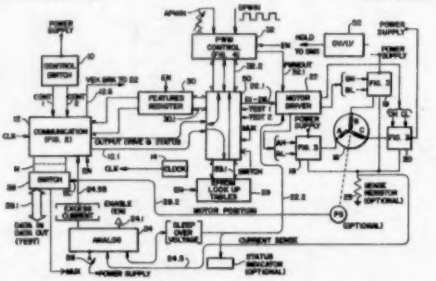
GENERAL PURPOSE MOTOR CONTROLLER

David W. Welch, Columbus, Miss., assignor to United Technologies Motor Systems, Columbus, Miss.

Filed Jul. 29, 1993, Ser. No. 99,669

Int. Cl.[6] H02P *5/28*

U.S. Cl. 318—811 **21 Claims**



1. A motor control for providing signals to a motor drive to vary current in a DC motor, characterized by:

means for providing two binary primary motor control signals to determine motor direction and initiate motor operation;

a programmable memory containing operating characteristics for the motor;

communication means for receiving said two primary motor control signals comprising a first state machine with a plurality of states accessed in response to the binary status of said primary motor control signals relative to each other to operate the motor in different modes associated with said operating characteristics, said communication means comprising means for supplying program data to the programmable memory in response to externally supplied signals containing said program data, the first state machine being inactive when said externally supplied signals are applied;

pulse width modulation means comprising a second state machine responsive to a signal from the communication means to provide a pulse width modulation address signal in the presence of a pulse width modulation signal identifying either digital or analog pulse width modulation;

means for providing said pulse width modulation signal;

lookup table means for providing a secondary motor control signal to control motor speed in response to said pulse width modulation address signal; and

multiplexing means for directing the pulse width modulation address signal from the pulse width modulation means to the lookup table, for receiving the secondary motor control signal from the lookup table and for directing said signal to the pulse width modulator means, said pulse width modulator means providing a variable duty cycle signal in response to said secondary motor control signal to vary current flow in the motor.

5,486,748

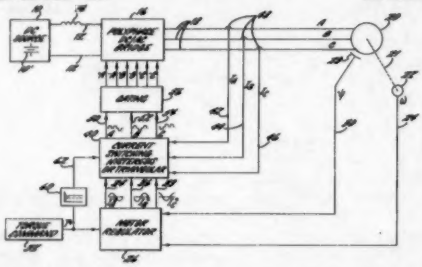
METHOD AND APPARATUS FOR IMPROVED EFFICIENCY IN A PULSE-WIDTH-MODULATED ALTERNATING CURRENT MOTOR DRIVE

Charles E. Konrad, and Richard W. Boothe, both of Roanoke, Va., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 837,467, Feb. 14, 1992, Pat. No. 5,287,051. This application Feb. 14, 1994, Ser. No. 195,636

Int. Cl.[6] H02P *5/28*

U.S. Cl. 318—811 **22 Claims**



16. A polyphase alternating current motor drive of the type in which the motor is provided electrical power from a controllable direct current to alternating current power inverter, said motor drive comprising:

(a) means to provide a torque command signal having a value representing a desired output torque of the motor; and

(b) control means for controlling the power inverter in a pulse-width-modulated mode in response to said torque command signal, said control means comprising frequency modulation control means for effecting relatively higher rates of pulse modulation in response to values of said torque command signal representing low values of motor output torque than to values of said torque command representing high values of motor output torque and to provide a constant number of modulating pulses for values of said torque command signal representing values of desired torque higher than a predetermined value of desired torque;

(c) wherein the higher number of modulating pulses produce a power wave shade more closely approximating a sine wave to thereby lower harmonic heating of the motor when switching currents are low, and the lower number of modulating pulses reduce switching losses of the power inverter when switching currents are high.

5,486,749

MULTIPLE BATTERY CHARGER WITH A POWER SOURCE CONTROL

Gerald L. Brainard, San Jose, Calif., assignor to AST Research, Inc., Irvine, Calif.

Filed Jun. 21, 1993, Ser. No. 80,272

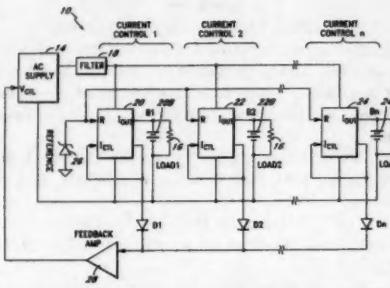
Int. Cl.[6] H02K *7/18;* **H02P** *3/00*

U.S. Cl. 320—9 **8 Claims**

1. A battery charging apparatus which continuously. charges multiple batteries during a charging cycle, comprising:

a power supply which provides charging current to all batteries simultaneously;

a plurality of linear current limiters coupled to said power supply and each linear current limiter further connected to a respective battery to continuously provide charging current to said respective battery during said charging cycle, wherein each current limiter includes means to control the amount of charging current supplied to said respective battery; and



means, coupled to said power supply and to each battery, and to each of said plurality of linear current limiters, for providing feedback information indicative of a voltage level of said respective battery to each of said plurality of current limiters, wherein each of said plurality of linear current limiters reduces the voltage drop across itself in response to said feedback information to maintain substantially constant current through said respective battery during said charging cycle.

5,486,750

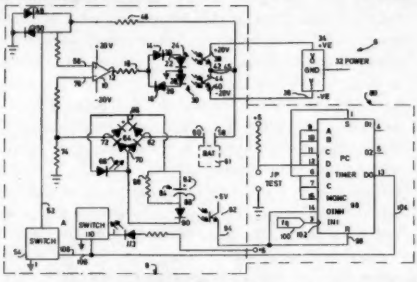
BATTERY CHARGER WITH POLARITY SENSING AND TIMER

Laverne A. Walborn, 142 Willow Avenue, Toronto, Ontario, and Brian W. H. Wong, 31 Benfrisco Crescent, Scarborough, Ontario, both of, Canada

Filed Jan. 4, 1994, Ser. No. 177,166

Int. Cl.[6] H01M *10/46*

U.S. Cl. 320—25 **7 Claims**



1. A battery charger comprising a charging circuit to charge a battery and a control circuit to control said charging circuit, said charging circuit having a pair of electrical contacts to be connected to a corresponding pair of terminals of the battery to be charged to transfer charge thereto and a power supply having a pair of sources of opposite polarity and each connected to a respective one of said pair of electrical contacts by a respective one of a pair of current switches, said control circuit including an operational amplifier having an input connected to said charging circuit and an output operable upon said switches and being operable to monitor charging current flowing in said charging circuit and operate one of said current switches to connect to said one of said contacts a source of the same polarity as that of the one of said battery terminal connected thereto, said control circuit maintaining said charging current in said charging circuit at a predetermined level and having a reference input applied to said amplifier, said reference input being connected to said one of said contacts to apply a reference voltage of the same polarity as said one of said sources to said reference input.

5,486,751

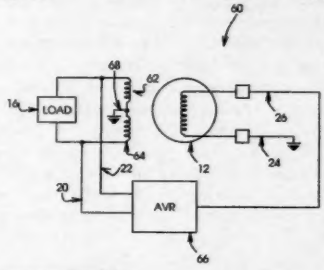
ELECTRONIC TRIMMING VOLTAGE REGULATOR

David J. Koenig, Wyoming, Minn., assignor to Onan Corporation, Minneapolis, Minn.

Continuation of Ser. No. 193,519, Feb. 8, 1994, abandoned, which is a continuation of Ser. No. 843,415, Feb. 27, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 294,201

Int. Cl.[6] H02P *9/00*

U.S. Cl. 322—86 **19 Claims**



3. A generator, comprising:

a rotating field winding having a first and a second end;

flux sensing means, coupled with the rotating field winding, for sensing a magnetic flux generated by said rotating field winding; and

excitation current means, connecting between the flux sensing means and the rotating field winding, for providing, as a function of the magnetic flux generated by said rotating field winding, excitation current to said rotating field winding in order to generate controlled magnetic flux, said excitation current means comprising:

voltage reference means, coupled between a connecting juncture of said flux sensing means and one end of said rotating field winding, for establishing a reference voltage;

first voltage conversion means connected between said flux sensing means and said rotating field winding for converting power from said flux sensing means to provide an uncontrolled level of excitation current sufficient to induce a first level of magnetic flux; and

second voltage conversion means connected between said flux sensing means and said rotating field winding for converting power from said flux sensing means to provide a controllable level of excitation current which, when added to said uncontrolled level of excitation current, acts to induce a second level of magnetic flux.

5,486,752

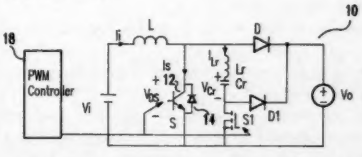
ZERO-CURRENT TRANSITION PWM CONVERTERS

Guichao C. Hua, and Fred C. Lee, both of Blacksburg, Va., assignors to Center for Innovative Technology, Herndon, Va.**

Filed Jun. 17, 1994, Ser. No. 262,049

Int. Cl.[6] H02M *3/335*

U.S. Cl. 323—222 **15 Claims**



1. A pulse-width-modulated d.c to d.c. converter, comprising:

a d.c. voltage input means;

a d.c. voltage output means;

a pulse-width modulating switch electrically connected between said d.c. voltage input means and said d.c. voltage output means;

a resonant branch connected between said d.c. voltage input means and said d.c. voltage output means, said resonant branch comprising a resonant inductor connected directly in series with a resonant capacitor;

an auxiliary switch means for electrically connecting and electrically disconnecting said resonant branch from said d.c. voltage input means and said d.c. voltage output means; and

a diode having .a first connection between said resonant capacitor and said auxiliary switch means, and a second connection connected to said d.c. voltage output means, said auxiliary switch means electrically connecting said resonant branch between said d.c. voltage input means and said d.c. voltage output means during a period when said pulse-width modulating switch is switching from an on-state to an off-state to create a zero-current condition in said pulse-width modulating switch.

5,486,753

SIMULTANEOUS CAPACITIVE OPEN-CIRCUIT TESTING

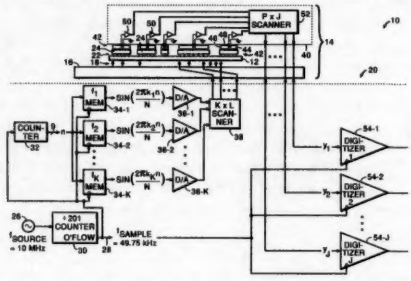
Moses Khazam, Lexington, and Aldo Mastrocola, Everett, both of Mass., assignors to GenRad, Inc., Concord, Mass.

Continuation of Ser. No. 100,000, Jul. 30, 1993, abandoned. This application Sep. 8, 1994, Ser. No. 302,227

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—72.5 **2 Claims**

1. For testing, on a circuit board on which is mounted a circuit



package that houses an integrated circuit and provides IC pins intended to be conductively connected to conductive paths respectively associated therewith on the circuit board, the continuity between a plurality of the IC pins and the conductive board paths respectively associated therewith, a method comprising the steps of:

A) applying an AC signal of a different test frequency respectively associated therewith to each of a plurality of the board paths associated with the IC pins;

B) capacitively sensing the resultant electric-field signal in the vicinity of the circuit package;

C) determining the contribution of each of the test frequencies to the sensed signal; and

D) if the contribution of a given test frequency is less than a predetermined threshold associated therewith, generating an indication of a lack of continuity between the board path associated with the given test frequency and the IC pin associated with that board path.

5,486,754

ELECTRIC CURRENT MEASUREMENT

Andrew J. Cruden, Lennoxtown; James R. McDonald, Newton Mearns; Ivan Andonovic, Bearsden; Kenneth Allan, Erskine, and Raymond A. Porrelli, East Kilbride, all of, Scotland, assignors to Instrument Transformers Limited, Glasgow, Scotland

PCT No. PCT/GB93/00134, § 371 Date Jul. 21, 1994, § 102(e) Date Jul. 21, 1994, PCT Pub. No. WO93/15410, PCT Pub. Date Aug. 5, 1993

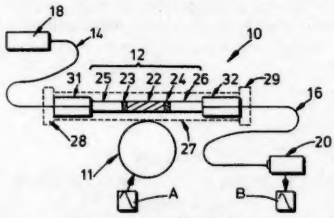
PCT Filed Jan. 22, 1993, Ser. No. 256,713

Claims priority, application United Kingdom, Jan. 29, 1992, 9201896

Int. Cl.[6] G01R *31/00*

U.S. Cl. 324—96 **6 Claims**

1. An electrical current measuring device, for measuring the



current in an electrical conductor (**11**), comprises first and second measurement channels, each channel comprising

a sensor (**12**) adapted to be located adjacent the conductor (**11**) and coupled via optical fibres (**14,16**) to source circuitry (**18**) and detector circuitry (**20**), the sensor (**12**), incorporating a material (**22**) which exhibits the Faraday magneto-optic effect and the source circuitry (**18**) being arranged to deliver an unpolarised light signal which is subsequently polarised by a first polariser (**23**) to enable a linearly polarised light signal to be incident to the material (**22**) and the quantum of rotation in the plane of polarisation imposed on the signal emerging from the material (**22**) being monitored via a second polariser (**24**) by the detector circuitry (**20**) as a measure of the electrical current flowing in the conductor (**11**),

wherein the sensor material (**22**) of the first channel is different from the sensor material (**22**) of the second channel, having a Verdet constant which is more temperature sensitive than that of the second channel;

each measurement channel is arranged to maintain a constant light intensity incident on its detector circuitry (**20**), and

gain-control circuitry (**17,19**) is provided at the outputs of the two measurement channels to deliver to an output terminal a modified measure of the sensed electrical current which is compensated against temperature variations,

the gain control circuitry (**17,19**) comprising a gain-controllable amplifier connected to the output of the detector circuitry (**20**) of the first channel, a divider (**17**) connected to the outputs of the respective detector circuitry (**20**) of the first and second channels for computing the ratio of said signals, means for comparing the computed ratio with pre-stored data (FIG. **3**) representative of known signal ratios achieved under known constant currents but varying temperatures whereby to evaluate a proportionality measure with respect to temperature,

and means for applying said proportionality measure to gain control the gain-controllable amplifier to provide the modified measure of the sensed electrical current from the detector circuitry (**20**) of the first channel.

5,486,755

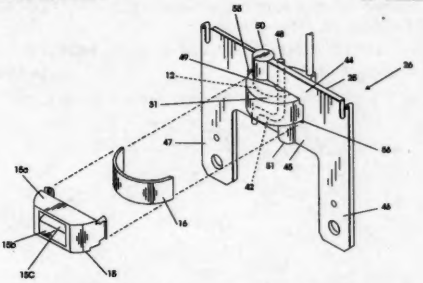
ELECTRONIC METER HAVING ANTI-TAMPERING MAGNETIC SHIELD

Patrick J. Horan, Dover; Richard A. Balch, North Hampton; David D. Elmore, Somersworth, all of N.H., and Joseph R. Legere, Sanford, Me., assignors to General Electric Company, New York, N.Y.

Filed Dec. 27, 1994, Ser. No. 364,109

Int. Cl.[6] G01R *11/48;1/20*

U.S. Cl. 324—110 **20 Claims**



1. An electronic meter for measuring electricity and being resistant to tampering by an externally applied magnetic field, said electronic meter comprising:

a housing comprising a base and a cover connected thereto;

a plurality of electrical current sensors positioned within said housing, each of said electrical current sensors comprising a toroidal coil defining a coil axis aligned transverse to the base, outermost ones of said toroidal coils having respective outermost coil portions positioned in closely spaced relation from an adjacent interior surface of said housing; and

a magnetic shield positioned adjacent each outermost toroidal coil to thereby resist tampering by a magnetic field applied from external to said housing, said magnetic shield having an arcuate cross-sectional shape corresponding to the outermost coil portion and having a predetermined arc length covering only a predetermined portion of the outermost coil portion.

5,486,756

DC CURRENT SENSOR

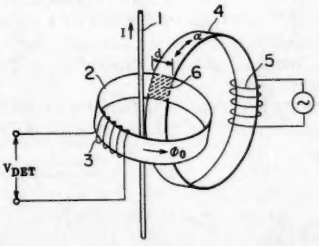
Makoto Kawakami, and Shigeru Yamaguchi, both of Osaka, Japan, assignors to Sumitomo Special Metals Co., Ltd., Tokyo, Japan

Division of Ser. No. 96,159, Jul. 9, 1993, abandoned. This application Mar. 13, 1995, Ser. No. 402,501

Claims priority, application Japan, Jul. 10, 1992, 4-207380; Jul. 10, 1992, 4-207381; Nov. 5, 1992, 4-322363; Jan. 26, 1993, 5-31361

Int. Cl.[6] G01R *1/04;31/00*

U.S. Cl. 324—127 **6 Claims**



1. A DC current sensor, comprising

an exciting core of soft magnetic material and formed with a pair of tubular bodies, each tubular body being positioned in parallel with the other to provide therebetween a space, through which passes a wire conducting a current to be detected;

a detecting core formed with the side faces of a pair of tubular bodies and two plate-like members of soft magnetic material, each of which connecting integrally with each of the inside edges thereof near an opening of said tubular bodies to form a rectangular frame-shaped member as a whole;

exciting coils, each of which magnetically energizing the exciting core in the direction perpendicular to the plane of the detecting core;

detecting coils, each of which being wound around said detecting core; and

means for applying an alternating current to the exciting coils to periodically and magnetically saturate the rectangular-shaped portions of said detecting core and exciting core, said means energizing said exciting coils to modulate a magnetic flux produced in the detecting core corresponding to the DC current flowing through said wire.

5,486,757

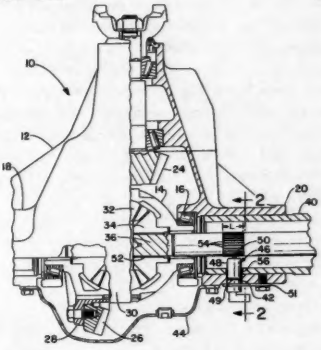
WHEEL-SPEED SENSORS FOR MOTOR VEHICLE MOUNTED IN THE SPREADER HOLES OF A DIFFERENTIAL CARRIER HOUSING

Paul D. Easley, Auburn, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Aug. 24, 1993, Ser. No. 111,125

Int. Cl.[6] G01P *3/48;3/52;* **F16H** *1/38;* **B23P** *11/00*

U.S. Cl. 324—174 **15 Claims**



1. A speed-sensing system to monitor the speed of individual wheels of a vehicle, comprising,

a vehicle drive axle including a differential carrier housing and case assembly rotatably mounted within said carrier housing, said carrier housing having first and second axle tubes coupled to and extending therefrom in which first and second axle shafts for said vehicle are disposed, said carrier housing having spreader holes formed therein at each location where said axle tubes are coupled to said carrier housing, wherein each of said axle shafts are drivingly engaged to said case

assembly and includes signal generating means associated therewith, and a sensing device mounted in said carrier housing at the location of said spreader holes and adjacent to said signal generating means to independently monitor the rotation of each of said axle shafts to generate a signal proportional to the speed of said axle shaft.

5,486,758

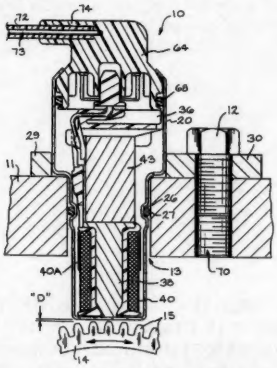
INTEGRAL VARIABLE RELUCTANCE SPEED SENSOR

Mark K. Hammerle, Fenton, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 132,737, Oct. 6, 1993, abandoned. This application Jan. 17, 1995, Ser. No. 374,401

Int. Cl.[6] **G01P** *3/48*

U.S. Cl. 324—174 **33 Claims**



1. A variable reluctance magnetic transducer comprising:

a pole piece having first and second ends;

a core having a first end portion formed about said pole piece, said pole piece extending through said first end portion, said core also having an intermediate portion adjacent to said first end portion, said intermediate portion including a chamber formed therein, said second end of said pole piece forming one end of said chamber, said chamber including an opening formed through the side of said intermediate portion, said opening adapted to receive a magnet, said intermediate portion also including means for retaining a magnet within said chamber, said core further having a second end portion adjacent to said intermediate portion and opposite from said first end portion;

a permanent magnet retained in said chamber, said magnet having an end contacting said second end of said pole piece;

a pair of electrical connectors supported by said second end portion of said core;

a coil wound about said core first end portion;

means for electrically connecting said coil to said electrical connectors;

a tubular housing having a closed first end and an open second end, said closed first end forming an inside surface, said housing receiving said core with said first end of said pole piece contacting said inside surface of said closed end and said second end of said core being contained within said housing; and

a bracket secured to said housing a predetermined distance from said closed end of said housing, said bracket having an aperture formed therethrough, said aperture adapted to receive a fastener.

5,486,759

DEVICE FOR DETECTING THE MOVEMENT OF A MOVABLE COMPONENT AND SIGNALLING THE DETECTED MOVEMENT OVER A SINGLE LINE

Hartmut Seiler, Baden-Baden; Guenter Haderer, Buehl; Volker Aab, Sasbach, and Cornelius Peter, Buehl-Neusatz, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

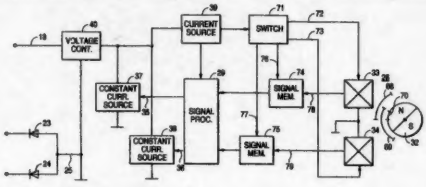
Filed Oct. 20, 1993, Ser. No. 138,208

Claims priority, application Germany, Jan. 21, 1992, 42 35 471.4; Mar. 13, 1993, 43 08 030.8

Int. Cl.[6] **G01P** *13/04;* **G01B** *7/30;7/02;* **H02P** *7/00*

U.S. Cl. 324—207.2 **14 Claims**

1. A device for detecting movement of a movable component,



said device comprising:

a first position sensor for outputting a first signal corresponding to at least a first position range of the movable component when the first position sensor senses the movable component within the first position range, the first signal having a single first discrete value;

a second position sensor for outputting a second signal corresponding to at least a second position range of the movable component when the second position sensor senses the movable component within the second position range, the second position range having an overlap region with said first position range, said second signal having a single second discrete value which is different from said first discrete value;

means for adding the respective discrete values of said first and second signals to produce a discrete sum signal, and for feeding the discrete sum signal to a single signal line; and

an evaluation arrangement connected to said single signal line for receiving and evaluating the sum signal on said single signal line and determining movement of the movable component based on the sum signal.

5,486,760

APPARATUS FOR CHECKING SURFACE FEATURES OF CONICAL PARTS INCLUDING A PROBE DISPOSED WITHIN A TRANSVERSAL GROOVE OF A ROLLER

Narciso Selleri, Monteveglio, and Giuliano Longhi, Bologna, both of, Italy, assignors to Marposs Societa' Per Azioni, Bentivoglio, Italy

PCT No. PCT/EP92/01484, § 371 Date Dec. 13, 1993, § 102(e) Date Dec. 13, 1993, PCT Pub. No. WO93/01493, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 1, 1992, Ser. No. 162,151

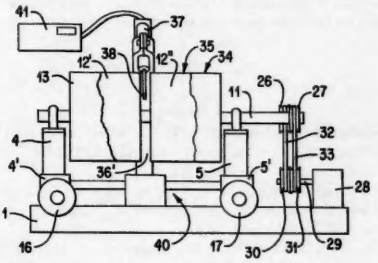
Claims priority, application Italy, Jul. 4, 1991, BO91A0240

Int. Cl.[6] **G01R** *33/038;* **G01N** *21/01*

U.S. Cl. 324—262 **18 Claims**

1. An apparatus for checking surface features of conical parts (**39**), comprising:

support means (**1–9, 14–25, 40**);



driving means, coupled to the support means, for supporting, rotating, and longitudinally advancing, substantially along a feed line, conical parts (**39**), the driving means including at least two substantially cylindrical rollers (**12**, **13**; **12'**, **12"**) coupled to the support means and defining two geometrical axes of rotation lying nonparallel to each other, and motor means (**28–33**) coupled to said rollers for rotating them; and

checking means (**37**, **38**, **41**) including a stationary probe adapted to scan the conical parts during their combined motion including rotation and advance feed; and

wherein said rollers are adapted to support a plurality of conical parts arranged substantially in a row and defining a transversal circular groove (**36**; **36'**), and wherein said probe is disposed within said transversal groove, whereby the parts forming said row are checked while passing in correspondence of said transversal groove.

5,486,761

NUCLEAR MAGNETIC RESONANCE MEASURING APPARATUS

Abdurrahman Sezginer, Brookfield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

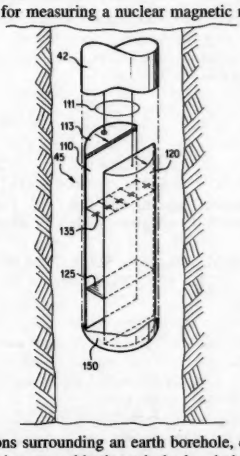
Continuation of Ser. No. 41,643, Apr. 1, 1993, Pat. No. 5,376,884. This application Jun. 15, 1994, Ser. No. 259,999

The portion of the term of this patent subsequent to Dec. 27, 2011, has been disclaimed.

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—303 **18 Claims**

1. Apparatus for measuring a nuclear magnetic resonance property of formations surrounding an earth borehole, comprising:



a logging device moveable through the borehole;

first and second elongated magnets having parallel axes of elongation generally parallel to the axis of the borehole and being disposed in said logging device in side-by-side spaced-apart arrangement;

an RF current loop disposed in the region between said magnets;

means for coupling RF energy to said RF current loop; and

means for detecting RF signals induced in said RF current loop.

5,486,762

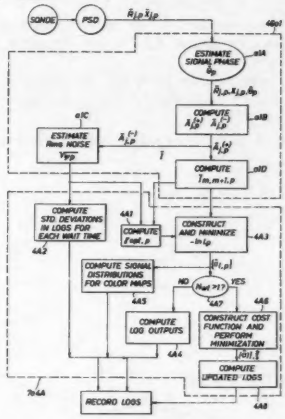
APPARATUS INCLUDING MULTI-WAIT TIME PULSED NMR LOGGING METHOD FOR DETERMINING ACCURATE T_2-DISTRIBUTIONS AND ACCURATE T_1/T_2 RATIOS AND GENERATING A MORE ACCURATE OUTPUT RECORD USING THE UPDATED T_2-DISTRIBUTIONS AND T_1/T

Robert Freedman, Houston, and Christopher E. Morriss, The Woodlands, both of Tex., assignors to Schlumberger Technology Corp., Houston, Tex.

Continuation-in-part of Ser. No. 127,978, Sep. 28, 1993, Pat. No. 5,381,092, which is a continuation of Ser. No. 970,332, Nov. 2, 1992, Pat. No. 5,291,137. This application Aug. 15, 1994, Ser. No. 291,960

Int. Cl.[6] G01R *33/20*

U.S. Cl. 324—303 **30 Claims**



1. A logging system, comprising:

first means adapted to be disposed in a wellbore for receiving a plurality of spin echo pulse sequences from a formation penetrated by said wellbore, generating a plurality of signals in response thereto, and transmitting said plurality of signals uphole when said first means is disposed in said wellbore;

second means adapted to be disposed at a surface of said wellbore for receiving said plurality of signals, said second means including,

spectral amplitude generation means responsive to said plurality of signals for generating a true polarization correction and a set of true spectral amplitudes corresponding to the true polarization correction, and

means responsive to the true polarization correction and said set of true spectral amplitudes corresponding to the true polarization correction for generating an output record medium illustrating a set of characteristics of said formation penetrated by said wellbore.

5,486,763

METHOD TO DISPLAY WITH COMBINED COLOR MULTIPLE QUANTITATIVE IMAGES OF TISSUE PARAMETERS OBTAINED WITH NUCLEAR MAGNETIC RESONANCE

Bruno Alfano, Naples, Italy, assignor to Consiglio Nazionale delle Ricerche, Italy

PCT No. PCT/IT92/00112, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO93/05405, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 9, 1992, Ser. No. 204,421

Claims priority, application Italy, Sep. 12, 1991, RM91A0680

Int. Cl.[6] G01R *33/48*

U.S. Cl. 324—309 **8 Claims**

1. A method of representation of physical tissue parameters in nuclear magnetic resonance (NMR), said method comprising a step of simultaneous representation of said parameters as combined color images, said color images being the result of overlapping of a least two parametric images obtained with chromatic scales different from one another and independent of one another, said physical tissue parameters comprise the longitudinal relaxation constant R1 and the transverse relaxation constant R2, which are defined by the formulas R1=1/T1 and R2=1/T2, wherein T1 and T2 are respectively the longitudinal and the transverse relaxation times that are characteristic of the voxel.

5,486,764

METHOD FOR DETERMINING SUBSURFACE ELECTRICAL RESISTANCE USING ELECTROSEISMIC MEASUREMENTS

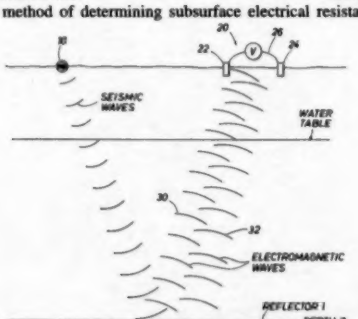
Arthur H. Thompson, and Grant A. Gist, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jan. 15, 1993, Ser. No. 4,959

Int. Cl.[6] G01V *11/00;3/12;3/30;1/00*

U.S. Cl. 324—323 **28 Claims**

1. A method of determining subsurface electrical resistance in



geological formations as a function of depth, comprising the steps of:

placing an antenna comprising at least two electrodes at a receiving location;

initiating a seismic wave into the earth from a source location such that the seismic wavefront encounters two or more reflectors and is converted to electromagnetic waves at each said reflector;

detecting a first electromagnetic wave from a first reflector;

detecting a second electromagnetic wave from a second reflector, wherein said second reflector is at a distance farther removed from said source location; and

determining the conductivity of the earth between said first and second reflectors and take distance from said source location to each of said first and second reflectors using said detected first and second electromagnetic waves.

5,486,765

INSULATING CONDITION DETECTING APPARATUS FOR A WIRE-CUT ELECTRICAL DISCHARGE MACHINE

Shunzo Izumiya, Fujiyoshida; Akihiro Sakurai, and Akiyoshi Kawahara, both of Minamitsuru, all of, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP93/00692, § 371 Date Feb. 4, 1994, § 102(e) Date Feb. 4, 1994, PCT Pub. No. WO93/24265, PCT Pub. Date Dec. 9, 1993

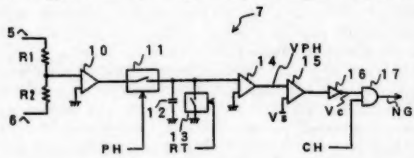
PCT Filed May 25, 1993, Ser. No. 190,158

Claims priority, application Japan, Jun. 4, 1992, 4-170125

Int. Cl.[6] B23H *1/02*

U.S. Cl. 324—537 **3 Claims**

1. An apparatus for detecting insulation between a wire electrode



and a workpiece of a wire-cut electrical discharge machine, comprising:

a capacitor storing a charged voltage to be applied between the wire electrode and the workpiece;

a charging switching element for charging said capacitor;

a discharging switching element, formed of a semiconductor, for discharging a capacitor and for applying the charged voltage of said capacitor between the wire electrode and the workpiece;

voltage detecting means for detecting a voltage between the wire electrode and the workpiece caused by a leakage current from the semiconductor of said discharging switching element during a period through which said capacitor is being charged when said discharging switching element is turned off and said charging switching element is turned on; and

determining means for comparing the voltage detected by said voltage detecting means and a set reference value, and for determining a dielectric breakdown when the detected voltage is lower than said reference value.

5,486,766

METHOD FOR TESTING SWITCH MATRICES

Gregory B. Hibdon, Folsom, and John M. Ingram, Sacramento, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed May 20, 1994, Ser. No. 246,997

Int. Cl.[6] G01R *31/02*

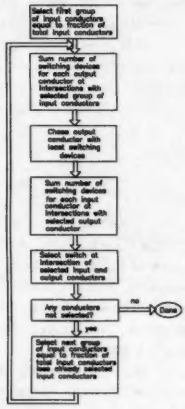
U.S. Cl. 324—537 **10 Claims**

1. A testing method for determining switching devices to close in a switch matrix having a plurality of input conductors and a plurality of output conductors arranged as logical rows and columns which intersect and having switching devices at a fraction of intersections comprising the steps of:

(step 1) selecting a combination of input conductors to be connected to the output conductors,

(step 2) summing the number of switching devices connected to each output conductor at intersections with the combination of input conductors,

(step 3) selecting an output conductor having a least number of switching devices at intersections with the combination of input conductors,


Select first group of input conductors equal to fraction of total input conductors
Sum number of switching devices for each output conductor at intersections with selected group of input conductors
Chose output conductor with least switching devices
Sum number of switching devices for each input conductor at intersections with selected output conductor
Select switch at intersection of selected input and output conductors
Any conductors not selected?
no
Done
yes
Select next group of input conductors equal to fraction of total input conductors less already selected input conductors

(step 4) summing the switching devices for each of the combination of input conductors having a switching device at an intersection with the selected output conductor,

(step 5) selecting an input conductor having the least number of switching devices,

(step 6) selecting a next combination of input conductors including all of the input conductors from the first combination except a previously selected input conductor arid all of the output conductors except a previously selected output conductor, and

(step 7) repeating each of the steps 2 through 6 until no conductors remain which have not been selected.

5,486,767

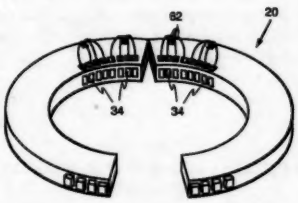
METHOD AND SYSTEM FOR DETECTING DEFECTS IN PIPES OR OTHER STRUCTURES

Robert J. Schwabe, Katonah; Michael R. Eggleston, Scotia, and Louis F. Coffin, Jr., Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 3, 1994, Ser. No. 206,297

Int. Cl.[6] G01R *27/14*

U.S. Cl. 324—715 **26 Claims**



1. A system for detecting defects in an object having a cylindrical surface, the system comprising:

a plurality of multiple pin electrodes sufficient to cover the circumference of the cylindrical surface, each multiple pin electrode having a single voltage pin and at least three (3) current pins contained therein;

structure for operatively positioning the electrodes relative to the object and in contact with the cylindrical surface; and

tension means, operatively connected to each pin, for urging the pins such that contact with the cylindrical surface is sufficiently equal between pins wherein a mathematical model can be utilized to analyze the object for defects.

5,486,768

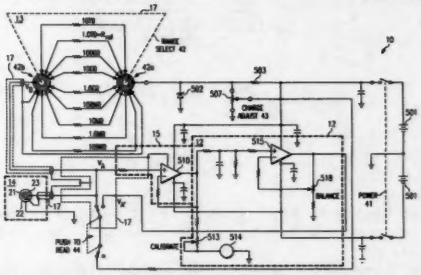
SURFACE RESISTIVITY METER FOR DETERMINING SURFACE DEGRADATION OF HIGH RESISTIVITY MATERIALS

Howard S. Silvus, Jr., San Antonio; William A. Mallow, Helotes; Charles H. Parr, and Jerome J. Dziuk, both of San Antonio, all of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed May 31, 1994, Ser. No. 251,393

Int. Cl.[6] G01R *27/02*

U.S. Cl. 324—718 **12 Claims**



1. An ohmmeter for measuring the value of an unknown surface resistance of a sample of material, comprising:

a voltage source circuit for supplying a low reference voltage;

a meter circuit connected across said unknown surface resistance for providing an output signal indicative of said unknown surface resistance;

an input circuit at the input to said meter circuit for providing a high input impedance to said meter circuit at a measurement input node;

a resistance circuit connected between said input node and said voltage source circuit, for receiving said reference voltage and for providing a reference resistance;

a probe circuit connected to said input node, said probe circuit having two electrodes for contacting the surface of said material, one connected to ground, thereby providing said unknown surface resistance, which divides the voltage across said voltage supply circuit to provide a voltage at said input node that is related to said unknown surface resistance;

a guard circuit for shielding connections to said input node, said guard circuit being in electrical communication with the output of said meter circuit;

wherein the combined gain of said input circuit and said meter circuit is adjustable to approximately unity; and

a quick charge circuit having a quick charge switch connected across said resistance circuit for bypassing said resistance circuit during charging of circuit capacitances.

5,486,769

METHOD AND APPARATUS FOR MEASURING QUANTITATIVE VOLTAGE CONTRAST

Wai K. Chim; Jacob C. H. Phang, and Daniel S. H. Chan, all of Singapore, Singapore, assignors to National University of Singapore, Crescent, Singapore

Filed Aug. 15, 1994, Ser. No. 290,527

Int. Cl.[6] G01R *31/00*

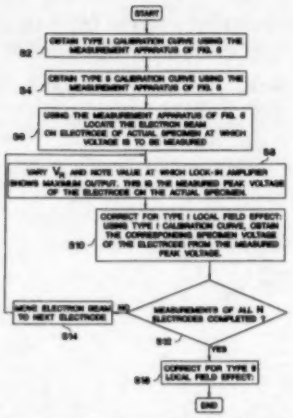
U.S. Cl. 324—751 **17 Claims**

1. A method of measuring quantitative voltage contrast comprising the steps of:

(a) outputting instructions from a processor to an energy analyzer and scanning electron microscope;

(b) locating an electron beam of said scanning electron microscope on a specimen electrode of a specimen structure based on said instructions;

(c) varying a grid voltage of said energy analyzer in accordance with said instructions;



(d) detecting secondary electron emission from said specimen electrode with a detector of said scanning electron microscope;

(e) determining a measured peak voltage of said specimen electrode based on output from said detector;

(f) obtaining a specimen electrode voltage corrected for type I local field effect error using said measured peak voltage and a type I calibration curve, said type I calibration curve representing peak voltage versus specimen electrode voltage; and

(g) correcting for type II local field effect error in output of said step (f) based on a type II calibration curve, said type II calibration curve representing a shift in specimen electrode peak voltage versus adjacent electrode voltage.

5,486,770

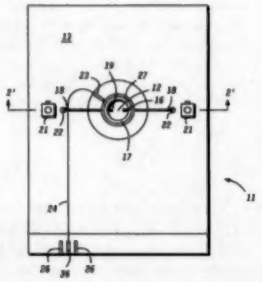
HIGH FREQUENCY WAFER PROBE APPARATUS AND METHOD

Scott V. Johnson, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 27, 1994, Ser. No. 265,876

Int. Cl.[6] G01R *31/00*

U.S. Cl. 324—754 **6 Claims**



1. A high frequency wafer probe apparatus comprising:

a substrate having a top surface, a bottom surface, and an opening extending through the substrate from the top surface to the bottom surface;

an insulating ring disposed within the opening; and a high frequency coaxial wafer probe having a first end and a second end, a conductor extending from the first end to the second end, a dielectric layer surrounding the conductor, a grounding layer surrounding the dielectric layer, and a pair of ground probe needles coupled to the grounding layer opposite each other, wherein the conductor extends beyond the dielectric layer and the grounding layer at the first end to form a signal probe needle; and wherein the pair of ground probe needles are adjacent the signal probe needle, and wherein the high frequency coaxial wafer probe is embedded in the insulating ring such that the signal probe needle and the pair of ground probe needles extend below the bottom surface of the substrate, and wherein the second end of the high frequency coaxial wafer probe is adapted for coupling to a high frequency tester.

5,486,771

BURN-IN SOCKET TESTING APPARATUS

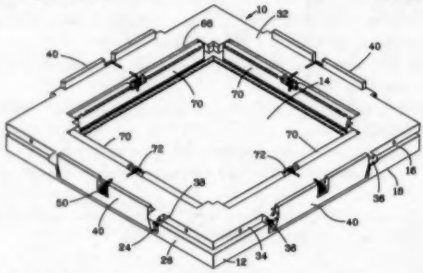
Keith L. Volz, Jamestown; Robert M. Renn, Pfafftown; Robert D. Iribeck, Greensboro; Frederick R. Deak, Kernersville, and David C. Johnson, Winston-Salem, all of N.C., assignors to Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 81,769, Jun. 23, 1993, abandoned.

This application Dec. 23, 1994, Ser. No. 363,559

Int. Cl.[6] G01R *31/02;* **H05K** *1/02*

U.S. Cl. 324—755 **21 Claims**



1. A burn-in socket testing apparatus for use with an integrated circuit chip, said apparatus includes electrical contact surfaces for electrical engagement with electrical contact surfaces formed on said chip, said apparatus comprising:

a first frame member having a first pusher member and a second pusher member, each said pusher member is pivotally mounted to said first frame member for independent pivotal motion relative to said first frame member;

a second frame member operatively connected to said first frame member for relative movement therebetween, said first and second frame members being adapted to cause pivotal movement in said pusher members during said relative movement, and the second frame member includes at least one camming surface which is adapted to engage one of said pusher members during said relative movement.

5,486,772

RELIABILITY TEST METHOD FOR SEMICONDUCTOR TRENCH DEVICES

Fwu-Iuan Hshieh, Saratoga; Calvin K. Choi, San Jose; William H. Cook, Fremont; Lih-Ying Ching, and Mike F. Chang, both of Cupertino, all of Calif., assignors to Siliconix incorporation, Santa Clara, Calif.

Filed Jun. 30, 1994, Ser. No. 268,755

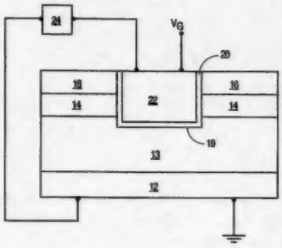
Int. Cl.[6] G01R *31/26*

U.S. Cl. 324—769 **10 Claims**

1. A method for testing the reliability of a trench transistor having a source, a gate, and a drain, said method comprising the steps of:

applying a first voltage to said gate;

coupling said drain to a second voltage different from said first voltage;



measuring a leakage current between said gate and said drain;

comparing said leakage current to a threshold current; and

identifying said trench transistor as a defective transistor if said leakage current is greater than said threshold current.

5,486,773

Patent Not Issued For This Number

5,486,774

CMOS LOGIC CIRCUITS HAVING LOW AND HIGH-THRESHOLD VOLTAGE TRANSISTORS

Takakuni Douseki; Junzo Yamada; Yasuyuki Matsuya, and Shinichirou Mutou, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

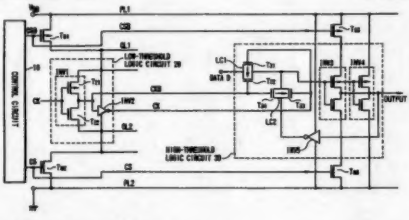
Continuation of Ser. No. 981,183, Nov. 24, 1992, abandoned.

This application Nov. 2, 1994, Ser. No. 333,235

Claims priority, application Japan, Nov. 26, 1991, 3-311007; Dec. 6, 1991, 3-323382; Dec. 9, 1991, 3-324512; Feb. 3, 1992, 4-017537

Int. Cl.[6] H03K *19/0948*

U.S. Cl. 326—33 **11 Claims**



1. A circuit comprising:

a logic circuit having a plurality of logic circuit elements each comprised of a plurality of field effect transistors;

first and second power lines for supplying power to said logic, with said first power line connected to a power source and with said second power line connected to a ground;

a first dummy power line connected to one of a plurality of power source terminals of said logic circuit; and

a first control transistor connected between said first dummy power line and said first power line, said first control transistor having a threshold substantially greater than thresholds of said field effect transistors of said logic circuit.

5,486,775

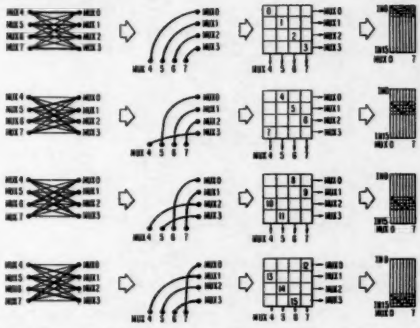
MULTIPLEXER STRUCTURES FOR USE IN MAKING CONTROLLABLE INTERCONNECTIONS IN INTEGRATED CIRCUITS.

Kerry Veenstra, San Jose, Calif., assignor to Altera Corporation, San Jose, Calif.

Filed Nov. 22, 1993, Ser. No. 156,260

Int. Cl.[6] H03K *19/177*

U.S. Cl. 126—38 **9 Claims**



3. An integrated circuit communication network comprising:

a plurality of substantially parallel, side by side, input conductors; and

a predetermined plural number of multiplexers, each of said multiplexers having a plurality of inputs, each of said input conductors being connected to an input of two of said multiplexers, wherein said input conductors form a plurality of adjacent, mutually exclusive groups of input conductors, each group having half as many input conductors as there are multiplexers, each multiplexer having inputs that are connected to said input conductors in said groups, such that each multiplexer is connected to one input conductor in each of said groups.

5,486,776

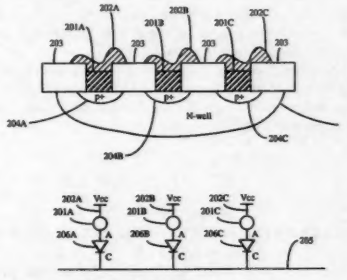
ANTIFUSE-BASED PROGRAMMABLE LOGIC CIRCUIT

David Chiang, Saratoga, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Sep. 29, 1994, Ser. No. 315,009

Int. Cl.[6] H03R *19/177*

U.S. Cl. 326—41 **6 Claims**



1. A programmable logic circuit comprising:

a first plurality of lines;

a second plurality of lines;

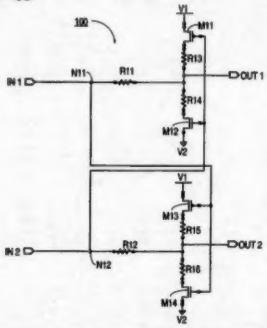
means for connecting at least one of said first plurality of lines to at least one of said second plurality of lines, wherein said means for connecting includes an antifuse and a diode connected in series, wherein said antifuse is formed over a diffusion area in a well area, and said diode is formed from said diffusion area and said well area.

5,486,777

LOW POWER DIFFERENTIAL RECEIVER INPUT CIRCUIT

Hai T. Nguyen, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 7, 1994, Ser. No. 301,462
Int. Cl.[6] H03K *19/0185;19/0948*
U.S. Cl. 326—68 **12 Claims**



3. A low power differential receiver circuit for respectively converting first and second differential input signals into first and second differential output signals, the receiver circuit comprising:

first and second input terminals for respectively receiving the first and second differential input signals, the first and second input terminals being respectively connected to first and second nodes;

a first output terminal connected to the first node through a first resistor;

a second output terminal connected to the second node through a second resistor;

a first transistor of a first type having a gate connected to the second node, a source connected to a first voltage source and a drain connected to the first output terminal;

a second transistor of a second type having a gate connected to the second node, a drain connected to the first output terminal and a source connected to a second voltage source;

a third transistor of the first type having a gate connected directly to the first node, a source connected to the first voltage source and a drain connected to the second output terminal; and

a fourth transistor of the second type having a gate connected directly to the first node, a drain connected to the second output terminal and a source connected to the second voltage source;

wherein a voltage of the first differential input signal controls the third transistor of the first type and the fourth transistor of the second type, thereby producing the second differential output signal at the second output terminal; and

wherein a voltage of the second differential input signal controls the first transistor of the first type and the second transistor of the second type thereby producing the first differential output signal at the first output terminal.

5,486,778

INPUT BUFFER FOR TRANSLATING TTL LEVELS TO CMOS LEVELS

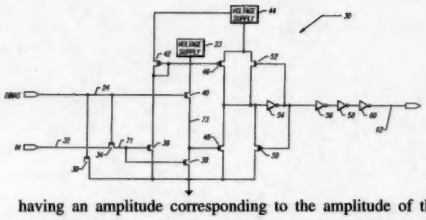
Perry W. Lou, Carlsbad, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Mar. 10, 1993, Ser. No. 28,999
Int. Cl.[6] H03K *19/0185;19/0948*
U.S. Cl. 326—71 **22 Claims**

1. In combination,

first means for providing an input voltage,

second means responsive to the input voltage for providing a first control voltage having a first amplitude for amplitudes of the input voltage greater than a first particular amplitude and



having an amplitude corresponding to the amplitude of the input voltage for amplitudes of the input voltage less than the first particular amplitude,

third means responsive to the first control voltage for providing a second control voltage having a second particular amplitude upon the occurrence of the second particular amplitude in the first control voltage and having an amplitude inverse to the amplitude of the first control voltage for amplitudes of the first control signal different from the second particular amplitude, and

fourth means responsive to the first and second control voltages for providing an output voltage related to the input voltage and having the same delay relative to the input voltage for rising and falling amplitude characteristics and having substantially the same rising and falling characteristics with respect to time.

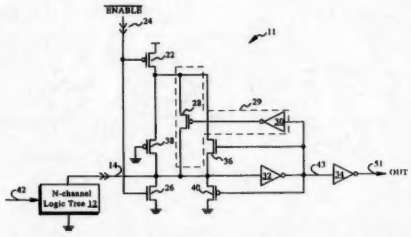
5,486,779

SENSE AMPLIFIER

John D. Eitrheim, Plano, Tex., assignor to Cyrix Corporation, Richardson, Tex.

Filed Dec. 29, 1994, Ser. No. 367,035
Int. Cl.[6] H03F *3/45*
U.S. Cl. 327—51 **18 Claims**

1. A sense amplifier comprising:



(a) sense means, coupled to receive input signals, for sensing logic levels and providing an output in response thereto;

(b) feedback means, coupled to the output of the sense means, for providing feedback to the sense means;

(c) load means, coupled between a positive voltage rail and the sense means and controlled by the feedback means, for selectively supplying current to the sense means;

(d) bleeder means, coupled in parallel with the load means, for supplying a weak current to the sense means; and,

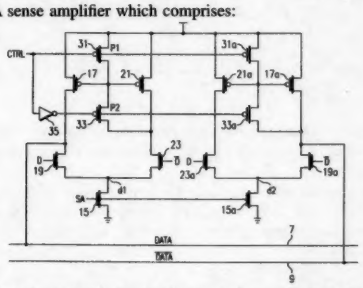
(e) dampening means, coupled between the sense means and a negative voltage rail and controlled by the sense means, for dampening a response of the sense means to the input signals.

5,486,780
TRI-STATEABLE CURRENT MIRROR SENSE AMPLIFIER

Hsindao Lu, Richardson, Tex., assignor to Texas Instruments Inc., Dallas, Tex.

Filed Oct. 19, 1994, Ser. No. 325,768
Int. Cl.[6] H03F *3/45;* **G06G** *7/12*
U.S. Cl. 327—53 **16 Claims**

1. A sense amplifier which comprises:



(a) a voltage supply terminal and a reference voltage terminal;

(b) a control transistor coupled to said reference voltage terminal and having a control electrode for receiving a first control signal;

(c) a first series circuit including a first transistor of a first channel type and a second transistor of opposite channel type coupled between said control transistor and said voltage supply terminal, said second transistor generating a first output signal and having a control electrode for receiving a first input signal; and

(d) a second series circuit including a third transistor of said first channel type and a fourth transistor of said opposite channel type coupled between said control transistor and said voltage supply terminal, said fourth transistor having a control electrode for receiving a second input signal;

(e) a fifth transistor of said first channel type coupled between said voltage supply terminal and control electrodes of said first channel type transistors and having a control electrode for receiving a second control signal; and

(f) a sixth transistor of said first channel type coupled between said control electrodes of said first channel type transistors and a junction of said third and fourth transistors and having a control electrode for receiving a third control signal.

5,486,781
BASE CURRENT-CONTROL CIRCUIT OF AN OUTPUT TRANSISTOR

Changsik Im, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 27, 1994, Ser. No. 187,038
Claims priority, application Rep. of Korea, Jan. 27, 1993, 1003/93
Int. Cl.[6] H03K *17/16;17/60*
U.S. Cl. 327—108 **12 Claims**

1. A base current-control circuit of an output transistor comprising:

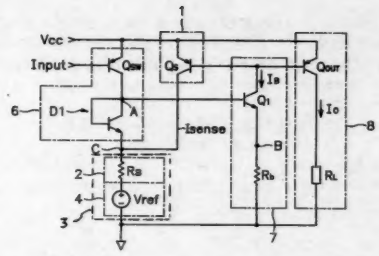
a detector for detecting an output load current of said output transistor and for enabling the circuit to generate a detected current in constant proportion to said output load current;

a base current-control voltage generator for generating a voltage as a function of said detected current in constant proportion to said output load current;

a switch for generating ON/OFF signals;

a reference voltage generator for generating a reference voltage; and

a base current generator for utilizing, said voltage generated by said base current-control voltage generator in constant proportion to said output load current and said reference voltage to



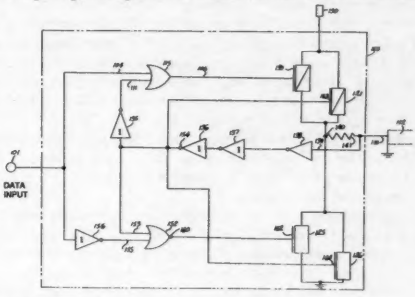
generate a base current for input to said output transistor as a function of the output load current in response to said ON/OFF signals.

5,486,782
TRANSMISSION LINE OUTPUT DRIVER

Francis H. Chan, Williston, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1994, Ser. No. 312,731
Int. Cl.[6] H03K *3/00*
U.S. Cl. 327—112 **14 Claims**

1. A push-pull output buffer circuit for use with a transmission



line comprising:

an input node and an output node;

first and second power source terminals;

a first primary gate circuit connected between the first power source terminal and the output node;

a second primary gate circuit connected between the output node and the second power source terminal;

a first auxiliary gate circuit connected in parallel with the first primary gate circuit;

a second auxiliary gate circuit connected in parallel with the second primary gate circuit;

control circuitry connected to the input node and responsive to an input signal to selectively turn on the first and second primary gate circuits; and

pulse-generating circuitry having an input connected to the output node and having outputs connected to the first and second primary gate circuits and first and second auxiliary gate circuits, the pulse-generating circuitry responsive to signals on the output node to selectively turn off the first and second primary gate circuits and to selectively turn the first and second auxiliary gate circuits on and off.

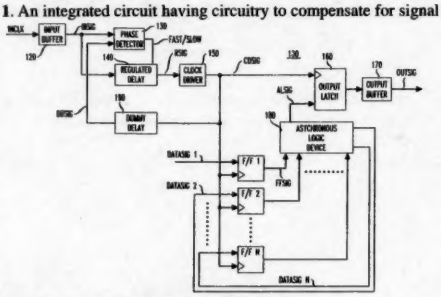
5,486,783

METHOD AND APPARATUS FOR PROVIDING CLOCK DE-SKEWING ON AN INTEGRATED CIRCUIT BOARD

Robert J. Baumert, Allentown, and Robert L. Pritchett, East Allen Township, both of Pa., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 31, 1994, Ser. No. 332,202
Int. Cl.[6] H03L *7/06*
U.S. Cl. 327—147 **13 Claims**

1. An integrated circuit having circuitry to compensate for signal



delays therein, said integrated circuit comprises:

a) a first input buffering means for receiving and buffering a clocked input reference signal, wherein said input buffer means generates a first signal delay upon said input reference signal;

b) signal regulating means coupled to said input buffering means for generating a synchronizing signal delay to said input reference signal for synchronizing an output data signal with said input reference signal, said signal regulating means having an output port and at least one input port and a feedback loop coupling said output port to said at least one input port;

c) a first output latching means coupled to said output port of said signal regulating means at a first input of said output latching means for latching said output data signal, wherein said output latching means generates a second signal delay upon said output data signal;

d) a first output buffering means coupled to said output latching means for buffering said output data signal, wherein said output buffering means generates a third signal delay upon said output data signal; and

simulated signal delay means coupled in said feedback loop for generating a delayed input signal to said signal regulating means, said delayed input signal having a generated simulated signal delay approximately equal to said first signal delay of said input buffering means, said second signal delay of said output latching means and said third signal delay of said output buffering means, wherein said delayed input signal is operative to enable said signal regulating means to provide a signal delay to said input reference signal so as to synchronize said input reference signal with said output data signal.

5,486,784

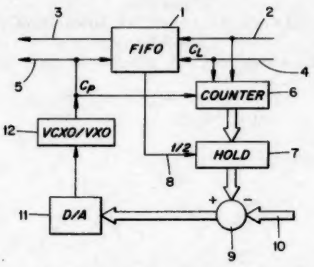
METHOD AND DEVICE FOR GENERATION OF CLOCK SIGNALS

Karl Ö. Eriksson, Askim, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Nov. 23, 1994, Ser. No. 346,915
Claims priority, application Japan, Nov. 26, 1993, 9303922-0
Int. Cl.[6] H03K *5/01*
U.S. Cl. 327—165 **15 Claims**

1. A method for regenerating clock rate information wherein data is intermediately stored in a memory to which the data is read at a first rate and out of which the data is read at a second rate, comprising the steps of:

determining a difference between two levels of an amount of data stored in the memory, wherein one of said two levels is a



level at which the memory provides an indication that the amount of data stored in the memory has reached a certain level;

comparing the difference with a reference value; and changing the second rate based on said comparison so that at subsequent measurements of the difference, the difference between the two levels of data and the reference value shall decrease.

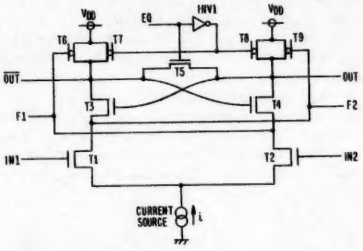
5,486,785

CMOS LEVEL SHIFTER WITH FEEDFORWARD CONTROL TO PREVENT LATCHING IN A WRONG LOGIC STATE

Dennis R. Blankenship, Durham, N.C., assignor to Mitsubishi Semiconductor America, Inc., Durham, N.C.

Filed Sep. 30, 1994, Ser. No. 316,462
Int. Cl.[6] H03L *5/00*
U.S. Cl. 327—306 **13 Claims**

1. Apparatus for level shifting from an input voltage range to an



output voltage range, comprising:

input differential amplifying means including first and second input transistors respectively supplied with first and second input signals having the amplitudes varying over said input voltage range, for forming a differential signal representative of a difference between the amplitudes of said first and second input signals,

output means responsive to said differential signal for latching in a first output logic state when said first input signal is larger than said second input signal, and for latching in a second output logic state when said first input signal is smaller than said second input signal, to form an output signal varying over said output voltage range, and

feedforward control means including first and second feedforward transistors respectively coupled to said second and first input transistors for preventing said output means from latching in said second output logic state when said first input signal is larger that said second input signal, and for preventing said output means from latching in said first output logic state when said first input signal is smaller than said second input signal,

wherein said output means comprises first and second output transistors respectively coupled to first and second output nodes of said output means,

said first and second feedforward transistors are respectively coupled in parallel to said first and second output transistors, and

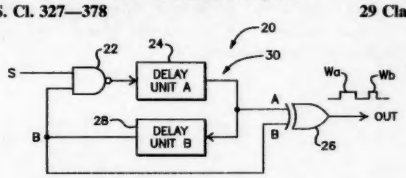
first and second isolation transistors are respectively coupled to said first and second output transistors to prevent a signal formed at said second output node from being supplied to a gate of said first feedforward transistor and to prevent a signal formed at said first output node from being supplied to a gate of said second feedforward transistor.

5,486,786

PROCESS MONITOR FOR CMOS INTEGRATED CIRCUITS

Teh-Kuin Lee, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Aug. 9, 1994, Ser. No. 287,653
Int. Cl.[6] H03K *17/14;9/08*
U.S. Cl. 327—378 **29 Claims**



1. A process monitor for a CMOS integrated circuit, comprising:

a ring oscillator that is fabricated integrally with the integrated circuit and includes PMOS circuit elements and NMOS circuit elements; and

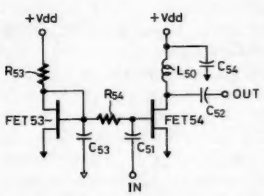
a processor for sensing pulses generated by the ring oscillator and computing a process factor for the integrated circuit as a predetermined function of a parameter of said sensed pulses that varies in accordance with relative electrical characteristics of the PMOS circuit elements and the NMOS circuit elements.

5,486,787

MONOLITHIC MICROWAVE INTEGRATED CIRCUIT APPARATUS

Itaru Maekawa; Takahiro Ohgihara, and Kuninobu Tanaka, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 7, 1994, Ser. No. 179,048
Claims priority, application Japan, Jan. 8, 1993, 5-016795; Mar. 18, 1993, 5-085641; Mar. 29, 1993, 5-069976
Int. Cl.[6] H03F *1/00;* **H02J** *1/00*
U.S. Cl. 327—560 **14 Claims**



1. A monolithic microwave semiconductor integrated circuit (MMIC), comprising:

a biased transistor formed of a compound semiconductor field effect transistor of an enhancement mode having a source directly connected to ground, its drain connected to a power supply potential, and its gate connected to a bias stabilizing circuit of a current mirror type:

said bias stabilizing circuit comprising first and second resistors, a bias control transistor formed of a compound semiconductor field effect transistor of an enhancement mode and having its source directly connected to ground, its gate directly connected to its drain, its drain connecting through said second resistor to a power supply potential, and its gate connecting through said first resistor to the gate of the bias transistor; and

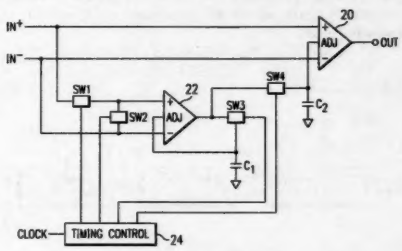
the gate of the bias control transistor being connected to ground through a first capacitor, a signal input being directly connected to the gate of the biased transistor through a second capacitor, an output being connected through a third capacitor to the drain of the biased transistor, and the drain of the biased transistor being directly connected to the power supply potential through an inductance.

5,486,788

CHOPPER STABILIZED OPERATIONAL TRANSCONDUCTANCE AMPLIFIER

Karl M. Schlager, Campbell, Calif., and Solomon K. Ng, Singapore, Singapore, assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Oct. 7, 1994, Ser. No. 320,142
Int. Cl.[6] H03F *1/02;1/14*
U.S. Cl. 330—9 **15 Claims**



1. A current amplifier circuit comprising:

a nulling operational transconductance amplifier having an non-inverting input, having an inverting input, having an offset adjustment input, and having a current output;

a first capacitor having a first plate connected to the offset adjustment input of said nulling operational transconductance amplifier and having a second plate connected to a voltage reference;

a main operational transconductance amplifier having an non-inverting input connected to a first input voltage, having an inverting input connected to a second input voltage, having an offset adjustment input, and having a current output;

a second capacitor having a first plate connected to the offset adjustment input of said main operational transconductance amplifier and having a second plate connected to the voltage reference;

a first switch having a conductive path between the second voltage and the non-inverting input to said nulling operational transconductance amplifier, and having a control element;

a second switch having a conductive path between the non-inverting input of said nulling operational transconductance amplifier and the inverting input of said nulling operational transconductance amplifier and having a control element;

a third switch having a conductive path between the output of said nulling operational transconductance amplifier and the offset adjustment input of said nulling operational transconductance amplifier and having a control element;

a fourth switch having a conductive path between the output of said nulling operational transconductance amplifier and the offset adjustment of said main operational transconductance amplifier and having a control element; and

a timing control circuit having a clock input for receiving a clock signal, having a first output connected to the control element of said first switch, having a second output connected to the control element of said second switch, having a third output connected to the control element of said third switch,

and having a fourth output connected to the control element of said fourth switch, for causing said first, second, third, and fourth switches to conduct current such that the current amplifier circuit is chopper stabilized,

wherein said timing control circuit controls said first, second, third, and fourth switches in four phases in accordance with the following table:

Phase	1st Switch	2nd Switch	3rd Switch	4th Switch
1	off	on	on	off
2	on	on	off	off
3	on	off	off	on
4	on	on	off	off

5,486,789

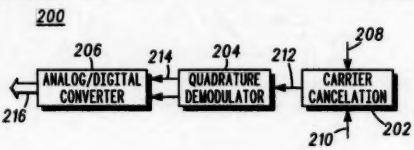
APPARATUS AND METHOD FOR PROVIDING A BASEBAND DIGITAL ERROR SIGNAL IN AN ADAPTIVE PREDISTORTER

Robert L. Palandech, Bartlett; Wayne H. Bradley, Bloomingdale; George F. Opas, Park Ridge, and James E. Mitzlaff, Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1995, Ser. No. 395,259

Int. Cl.[6] H03F *1/32*

U.S. Cl. 330—149 **10 Claims**



8. A method for providing a baseband digital error signal for an adaptive predistorter, wherein the adaptive predistorter comprises a first signal based on an amplifier output and a second signal based on a data input, the method comprising:

a) deriving a high frequency analog error signal as a difference between the first signal and the second signal;

b) deriving a baseband analog error signal by demodulating the high frequency analog error signal; and

c) deriving the baseband digital error signal by using an analog to digital conversion.

5,486,790

MULTISTAGE AMPLIFIER WITH HYBRID NESTED MILLER COMPENSATION

Johan H. Huijsing, Schipluiden, and Rudolphe G. H. Eschauzier, Spijenisse, both of, Netherlands, assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation of Ser. No. 197,539, Feb. 10, 1994, abandoned. This application Dec. 23, 1994, Ser. No. 365,332

Int. Cl.[6] H03F *3/45; 1/34*

U.S. Cl. 330—260 **19 Claims**

9. A multistage amplifier circuit with frequency compensation comprising:

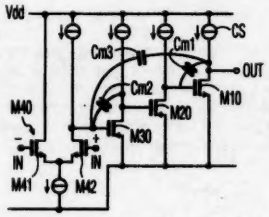
an input terminal and an output terminal;

first, second, third and fourth amplifier stages connected in cascade, each amplifier stage having an input and an output;

a first capacitor coupled between the output and input of the first amplifier stage;

a second capacitor coupled between the output and input of the third amplifier stage;

a third capacitor coupled between the output of the first amplifier stage and the input of the third amplifier stage;



means for coupling said input terminal and said output terminal to the input and the output of the amplifier stages comprising the first and last amplifier stages of the cascade, respectively; and wherein

said first, second and third amplifier stages comprise inverting stages; and

said fourth, third, second and first amplifier stage being connected in cascade in the order named between said input terminal and said output terminal.

5,486,791

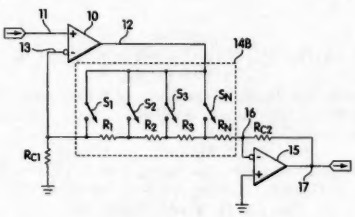
PROGRAMMABLE GAIN AMPLIFIER

Paul Spitalny, Allston, and Martin Mallinson, Billerica, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Continuation of Ser. No. 819,376, Jan. 9, 1992, Pat. No. 5,233,309. This application Jan. 29, 1993, Ser. No. 11,106 The portion of the term of this patent subsequent to Aug. 3, 2010, has been disclaimed.

Int. Cl.[6] H03G *3/30*

U.S. Cl. 330—282 **17 Claims**



17. A method for using an electrical circuit which includes: a first gain element having means for receiving an input, means for providing an output, and means for receiving a feedback signal; a second gain element having means for receiving an input and means for providing an output; an impedance having a first lead connected to the feedback signal receiving means and a second lead connected to the input receiving means of the second gain element; and a switch having a first state for connecting the output of the first gain element to the first lead of the impedance and having a second state for connecting the output of the first gain element to the second lead of the impedance, as a programmable gain amplifier, the method comprising the steps of:

selecting one of the first and second states for the switch;

setting the switch in the selected state;

applying a continuous AC input signal to the input of the first gain element; and

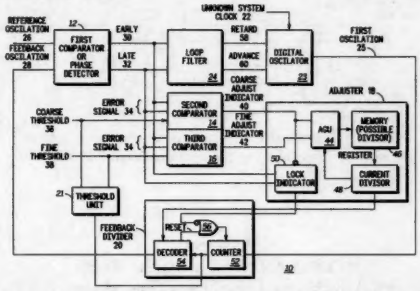
obtaining a continuous AC signal, which is a function of the input signal, from the output of the second gain element.

5,486,792

METHOD AND APPARATUS FOR CALCULATING A DIVIDER IN A DIGITAL PHASE LOCK LOOP

James W. Girardeau, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1995, Ser. No. 399,006
Int. Cl.[6] H03L 7/08;7/18
U.S. Cl. 331—10 20 Claims



1. A method for determining a feedback divider ratio in a phase lock loop from an unknown reference clock, the method comprising the steps of:

(a) upon a triggering event, comparing a reference oscillation with a feedback oscillation to produce an error signal;

(b) comparing the error signal with a coarse threshold; and

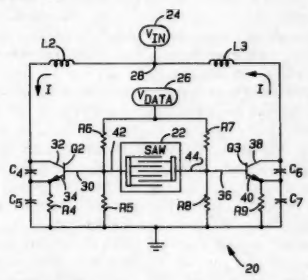
(c) when the error signal compares unfavorably to the coarse threshold, providing a coarse divisor adjustment to a feedback divider.

5,486,793

BALANCED RF OSCILLATOR AND TRANSMITTER

John P. Hill, Westland, Mich., assignor to United Technologies Automatove, Inc., Dearborn, Mich.

Filed Nov. 21, 1994, Ser. No. 342,721
Int. Cl.[6] H03B 5/36; H04L 27/04
U.S. Cl. 331—56 18 Claims



17. A method of generating and transmitting an oscillating RF signal comprising:

producing a resonance signal in a series tank input circuit;

generating an oscillating current signal in response to the resonance signal being applied to a first amplifier and a second amplifier;

applying the oscillating current signal to a first output tank so as to radiate first energy;

applying the oscillating current signal to a second output tank so as to radiate second energy; and

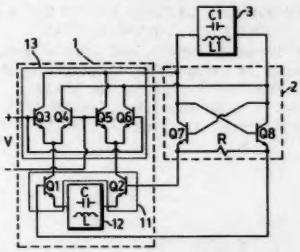
summing the first and second radiating energy from the first and second output tank so as to produce a summed radiating output.

5,486,794

VARIABLE FREQUENCY LC OSCILLATOR USING VARIABLE IMPEDANCE AND NEGATIVE IMPEDANCE CIRCUITS

Jieh-Tsong Wu, Taipei, and Wei-Zen Shen, Tou-Liu, both of, Taiwan, Prov. of China, assignors to National Science Council of R.O.C., Taipei, Taiwan, Prov. of China

Filed Dec. 15, 1994, Ser. No. 356,861
Int. Cl.[6] H03B 5/12;7/06
U.S. Cl. 331—115 15 Claims



1. A variable frequency oscillator, comprising:

a variable impedance circuit having an input terminal pair, an output terminal pair and a control input pair for receiving a control voltage to vary impedance of said variable impedance circuit;

a reactive load connected to said output terminal pair of said variable impedance circuit, said variable impedance circuit being a capacitive impedance when said reactive load is an inductive load and being an inductive impedance when said reactive load is a capacitive load; and

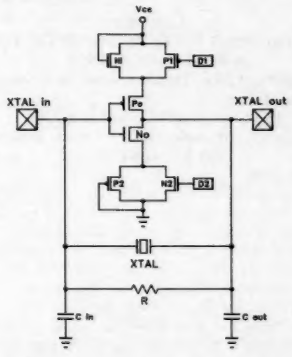
a negative impedance circuit having an output terminal pair connected to said output terminal pair of said variable impedance circuit and an input terminal pair connected to said input terminal pair of said variable impedance circuit, said negative impedance circuit serving as a positive feedback path for said variable impedance circuit.

5,486,795

LOW POWER CRYSTAL OSCILLATOR

John R. Spence, Villa Park; Rajiv Gupta, Brea, and Mingming Zhang, Alhambra, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Apr. 22, 1993, Ser. No. 51,134
Int. Cl.[6] H03B 5/06;5/36
U.S. Cl. 331—116 FE 8 Claims



1. A Pierce oscillator comprising:

(a) an inverter and a crystal in parallel;

(b) a voltage source;

(c) a load and a first switch in parallel between the voltage source and the inverter, the load comprising an NFET with its gate wired to its source, and the first switch comprising a PFET;

(d) means for enabling the first switch during power-up and for thereafter disabling the first switch.

5,486,796

OSCILLATOR CIRCUIT FOR RECEIVING A WIDE FREQUENCY BAND SIGNAL

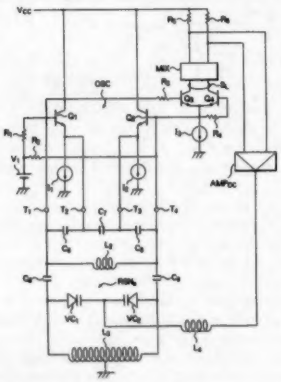
Nobuyuki Ishikawa, Kanagawa, and Tadashi Imai, Saitama, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 8, 1994, Ser. No. 354,836

Claims priority, application Japan, Dec. 20, 1993, 5-320252

Int. Cl.[6] H03B *5/12;* **H03D** *3/00;* **H03L** *7/099*

U.S. Cl. 331—117 R **13 Claims**



1. An oscillator comprising:

a differential type amplifier formed by first and second transistors;

a resonance circuit, output terminals thereof being connected to bases of said first and second transistors;

a first inductive element directly connected between said bases of said first and second transistors; and

a second inductive element connected to said resonance circuit in parallel, a point dividing inductance thereof into substantially two equal values being grounded.

5,486,797

INTEGRATED PORT SELECTION CIRCUIT FOR HIGH FREQUENCY SIGNAL

Tomohiro Suzuki, Chiba, Japan, assignor to Uniden Corporation, Chiba, Japan

Filed Nov. 8, 1994, Ser. No. 337,816

Claims priority, application Japan, Aug. 4, 1994, 6-183452

Int. Cl.[6] H01P *1/15*

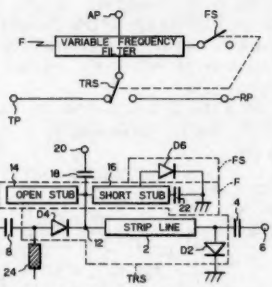
U.S. Cl. 333—104 **8 Claims**

1. A port selection circuit for selectively connecting any one of first to n-th ports to an (n+1)-th port, where n is an integer larger than 1, first to n-th frequencies respectively assigned to said first to n-th ports being different from each other, said circuit comprising:

first to n-th switches each including one end connected to a corresponding one of said first to n-th ports and the other end connected to a common junction point;

a variable frequency filter which is connected between said common junction point and said (n+1)-th port and is settable to a frequency characteristic permitting any one of said first to n-th frequencies to pass; and

means responsive to the operation of any one of said first to n-th switches for causing said variable frequency filter to set to a



frequency characteristic permitting a frequency assigned to the port corresponding to the operated switch to pass.

5,486,798

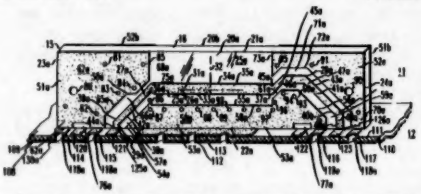
MULTIPLANAR HYBRID COUPLER

William K. Veitschegger, Pickerington, Ohio, assignor to AT&T IPM Corp., Coral Gables, Fla.

Continuation-in-part of Ser. No. 206,996, Mar. 7, 1994, abandoned. This application Dec. 7, 1994, Ser. No. 350,600

Int. Cl.[6] H01P *5/18*

U.S. Cl. 333—116 **22 Claims**



1. A microwave coupler device comprising: a horizontally and vertically extending dielectric coupler board having a longitudinally horizontal bottom margin, thickness in the transversely horizontal dimension, and front and back surfaces separated by said thickness, front and back flat elongated metallic conductors on said front and back surfaces and respectively comprising front and back central strips centrally located on said board and registering with each other through said board to be broadside coupled with each other, said strips each extending longitudinally between opposite ends thereof which are left and right ends in the front-to-back traverse direction, said front and back conductors further comprising: two front leads in said front conductor which are left and right leads having junctions with, respectively, said left and right ends of said front strip, and two back leads in said back conductor which are left and right leads having junctions with, respectively, said left and right ends of said back strip, said two front leads and two back leads having, respectively, two front and two back terminations extending downwardly to lower ends thereof constituting respective ports disposed on said board's front and back surfaces at said bottom margin, the two ports at said margin on each of the front and back surfaces of said board being longitudinally spaced at said bottom margin from all the other of said ports, said front and back conductors having overall lengths extending from one to the other of the two ports constituting respective pairs thereof on, respectively, said front surface and said back surface, and said device further comprising: a plurality of front metallic ground plane regions on said front surface and spaced thereon from, respectively, said front leads and said front strip by front lead-bordering gaps on either side of each of said front leads, and by a front strip-bordering gap below said front strip, and a plurality of back metallic ground plane regions on said back surface and spaced thereon from, respectively, said back leads and said back strip by back lead-bordering gaps on either side of each of said back leads, and by a back strip-bordering gap below said back strip, said front ground plane regions and back ground plane regions having

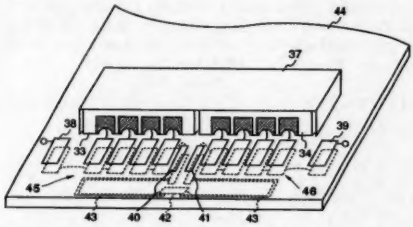
respective terminations on, respectively, said front surface and back surface which are disposed at said bottom margin to each be longitudinally spaced at said margin from the other and from each of said downwardly extending terminations of the two leads on that surface, said flat conductors and adjacent portions of said ground plane regions providing transmission lines, inclusive of the leads and strip in each such conductor, for conveyance of microwaves between the ports at the opposite ends of such conductors, and said leads and ground plane regions on each of said surfaces being mutually disposed so that all said leads over at least most of their lengths are non-overlapping through said board with any other lead while being overlapping through said board with portions of ground plane regions on the opposite side of said board.

5,486,799

STRIP LINE FILTER AND DUPLEXER FILTER USING THE SAME

Tomokazu Komazaki; Katsuhiko Gunji; Kazushige Noguchi, and Kunihiro Tanoie, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 56,626, May 4, 1993, abandoned. This application Oct. 20, 1994, Ser. No. 326,368
Claims priority, application Japan, May 8, 1992, 4-116159
Int. Cl.[6] H01P *5/12;1/202;1/203*
U.S. Cl. 333—134 **22 Claims**



15. A duplexer filter, comprising: a transmitting filter and a receiving filter, each comprising a strip line filter, including

a rectangular box-shaped, dielectric block having opposite side faces, opposite front and back faces, and opposite top and bottom faces, said block having a plurality of parallel grooves, formed with a predetermined spacing therebetween and extending from said top face to said bottom face,

an outer conductor formed of a thin film conductive material, covering said side faces, said back face, and said bottom face,

a plurality of resonators, each formed of a thin film of conductive material and covering the respective surfaces of said grooves, each to said resonators being connected to said outer conductor,

a substrate, disposed in parallel to one face of said dielectric block, and

a plurality of capacitors, each having a pair of opposing electrodes formed on said substrate, said capacitors being positioned next to each other and connected to respective ones of said resonators, said plurality of capacitors including a first capacitor having one side connected to a first one of said resonators, a second capacitor having one side connected to a last one of said resonators, and a third capacitor connected between the other side of one of said first and second capacitors and one of the resonators adjacent to the resonator to which the one side of said one of said first and second capacitors is connected; and

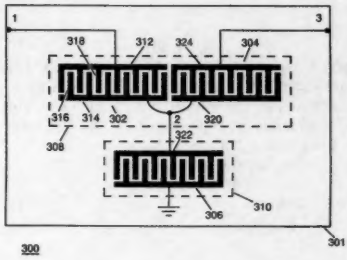
a separating circuit connected to said transmitting and receiving filters so as to convey a transmit signal from said transmitting filter to an antenna and to convey a receive signal from the antenna to said receiving filter, said separate circuit including a substrate and circuitry thereon, formed by a strip line; wherein the substrates of said transmitting filter and said receiving filter are disposed adjacent to said substrate of said separating circuit.

5,486,800

SURFACE ACOUSTIC WAVE DEVICE

Roger A. Davenport, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1994, Ser. No. 314,835
Int. Cl.[6] H03H *9/64*
U.S. Cl. 333—193 **20 Claims**



1. A surface acoustic wave (SAW) device operating over a passband having a center frequency, comprising:

a piezoelectric substrate having at least two acoustic tracks;

at least two interdigital transducers located on one acoustic track, operating at resonance at the center frequency;

at least one interdigital transducer located on a second acoustic track, operating at anti resonance at the center frequency;

the at least two interdigital transducers on the one acoustic track are acoustically and electrically coupled and the at least one interdigital transducer on the second acoustic track is electrically coupled to the at least two interdigital transducers on the one acoustic track; and

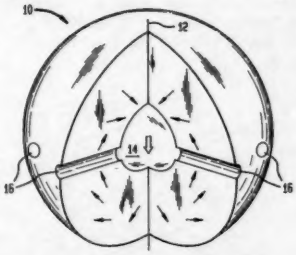
the at least two interdigital transducers on the one acoustic track are tuned for resonance at the center frequency using independently adjustable electrical and acoustic coupling while the at least one interdigital shunt transducer on the second acoustic track is tuned for anti resonance at the center frequency using independently controlled electrical coupling.

5,486,801

SPHERICAL MAGNET STRUCTURE FOR USE IN SYNCHROTRON RADIATION SOURCE

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1994, Ser. No. 349,221
Int. Cl.[6] H01F *7/02*
U.S. Cl. 335—306 **6 Claims**



1. A source of synchrotron radiation, comprising:

a sphere fabricated of permanently magnetic material with a cavity centrally disposed therein and passage means disposed equatorially thereabout for entering and exiting the cavity, the sphere being magnetized to pass a magnetic field through the cavity in parallel with a magnetic axis which extends between poles thereon; and

means for introducing charged particles through the passage means to a plane oriented perpendicularly across the magnetic axis within the cavity wherein such particles are influenced by the magnetic field to travel in a circular path around the magnetic axis and thereby generate synchrotron radiation which emits from the cavity through the passage means.

5,486,802

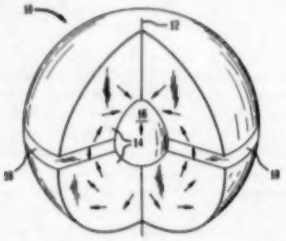
SPHERICAL MAGNET STRUCTURE AND USE THEREOF IN SYNCHROTRON RADIATION SOURCE

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1994, Ser. No. 349,222

Int. Cl.[6] H01F *7/02*

U.S. Cl. 335—306 **10 Claims**



1. A magnet structure, comprising:

a spherical shell fabricated of active magnetic material with an equatorial gap disposed thereinto about the entire periphery thereof and having a solid core fabricated of a second magnetic material centrally disposed therein, the shell being magnetized to sustain a magnetic field across the gap in a direction parallel with a magnetic axis which extends between poles thereon and through the core.

5,486,803

SIGNAL DISCRIMINATOR

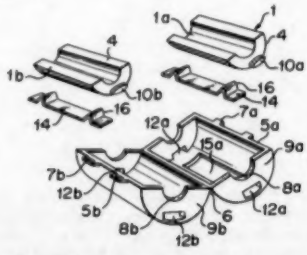
Osamu Igarashi, Yokohama; Akira Naitou, Sagamihara; Hikohiro Tougane, Sagamihara; Hironobu Tsutsumi, Sagamihara, and Toshihisa Kudou, Sagamihara, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Nikko Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 816,570, Jan. 3, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 206,278

Claims priority, application Japan, Jan. 24, 1991, 3-006836; Jan. 24, 1991, 3-006837; Jul. 1, 1991, 3-160330

Int. Cl.[6] H01F *17/06;27/02;27/26*

U.S. Cl. 336—92 **3 Claims**



1. A signal discriminator comprising:

a plurality of divided magnetic cores, each having an engaging protrusion;

a resin case formed of a plurality of sections, each section having a recess for engagingly accommodating a respective engaging protrusion from a corresponding one of the plurality of divided magnet cores, wherein the engaging protrusions and the recesses are respectively formed at both ends of each of the plurality of divided magnetic cores and at both ends of each of the plurality of sections of the resin case; and

a plurality of press-contacting means formed of a resilient material, wherein a respective one of the plurality of press-contacting means is arranged between each of the plurality of divided magnetic cores and the corresponding one of the plurality of sections of the resin case, and wherein each of the plurality of press-contacting means comprise a unitary resilient member having at least two protrusions;

a cut-out portion formed in each section of the resin case at a position where the respective of the plurality of press-contacting means is arranged, a portion of the respective of the plurality of press-contacting means extending beyond the cut out portion such that each end of the plurality of press-contacting means contacts a respective end of the plurality of sections of the resin case.

5,486,804

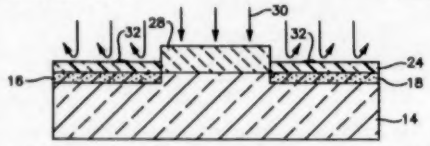
INTEGRATED MAGNETORESISTIVE SENSOR FABRICATION METHOD AND APPARATUS

Marko Sokolich, Los Angeles; Hiroyuki Yamasaki, Palos Verdes Estates, and Huai-Tung Yang, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 3, 1993, Ser. No. 161,021

Int. Cl.[6] H01L *43/00*

U.S. Cl. 338—32 R **8 Claims**



1. A method of forming a magnetoresistor, comprising the steps of:

(a) providing a semiconductor substrate;

(b) forming a mask on said substrate, said mask having a window at the desired location of said magnetoresistor;

(c) depositing a layer of a magnetoresistive material on said substrate within said window wherein said magnetoresistive material is substantially non-adherent to said mask and said magnetoresistive material is deposited to a predetermined thickness; and

(d) removing said mask to thereby form said magnetoresistor.

5,486,805

METHOD OF RECEIVING UNSOLICITED MESSAGES ON AN ELECTRICAL DISTRIBUTION NETWORK COMMUNICATIONS SYSTEM

Sioe T. Mak, Chesterfield, Mo., assignor to Distribution Control Systems, Inc., St. Louis, Mo.

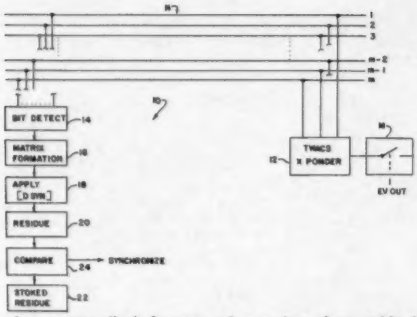
Filed Jul. 6, 1993, Ser. No. 86,085

Int. Cl.[6] H04M *11/04;* **G08B** *1/08;* **H04Q** *1/30*

U.S. Cl. 340—310.06 **12 Claims**

1. In a two-way communication system used with an electrical power distribution network, the communication system providing both outbound and inbound messages to and from remote network locations, a method of detecting and decoding unsolicited inbound messages from the remote locations comprising:

forming an unsolicited message at a remote location in response to the occurrence of a time independent event at that location, each message including a series of message bits each of which



has a prescribed format, and a series of preamble bits arranged in a predetermined bit pattern at the beginning of the message;

transmitting the unsolicited message over any one of a plurality of selected communication channels normally used for two-way communications, said channels being selected for their relative immunity to noise;

receiving the unsolicited message at a receiving site, receiving the message including a receiver of the system being out of synchronization with the message, receipt of the message including first receiving the bits comprising the preamble, and then the bits comprising the message; and,

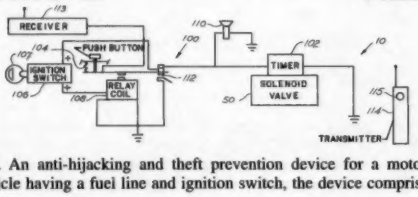
detecting the bits comprising the preamble as an indication an unsolicited message is being received, detecting the bits including forming a matrix comprising a plurality of values derived from the detection of bits comprising the unsolicited message, the bit values within the matrix being arbitrarily set such that bits having a zero value are set at zero, bits having a value between zero and a first predetermined value are set at zero, bits having a value greater than the first predetermined value are set a second predetermined value, and bits having a value less than a fourth predetermined value are set at a fifth predetermined value thereby to compensate for the effects of noise on the power distribution network.

5,486,806

ANTI-HIJACKING AND THEFT PREVENTION DEVICE FOR MOTOR VEHICLES

Harold A. Firari, N6604 Shorewood Hills Rd., Lake Mills, Wis. 53551, and John A. Werner, 11602 Watertown Plank Rd., Wauwatosa, Wis. 53226

Filed Nov. 9, 1994, Ser. No. 336,815
Int. Cl.[6] B60R *25/10*
U.S. Cl. 340—426 **8 Claims**



7. An anti-hijacking and theft prevention device for a motor vehicle having a fuel line and ignition switch, the device comprising:

a valve installed on the fuel line, the valve having an orifice formed therethrough;

a solenoid for moving the valve from an open position to a closed position, the solenoid connected to the valve;

a control means for controlling the solenoid connected to the solenoid and to the ignition switch;

the control means including a deactivating switch;

the control means maintaining the valve in the open position for a predetermined period of time after the ignition switch is activated;

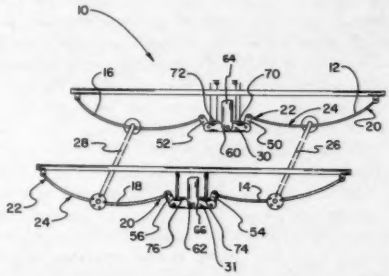
the control means activating the valve into the closed position at the end of the predetermined period of time provided the deactivating switch has not been activated.

5,486,807

LOW OR FLAT TIRE WARNING SYSTEM

Ray M. Price, 7015 N. Greenwich Ave., Portland, Oreg. 97217

Filed Mar. 14, 1994, Ser. No. 212,125
Int. Cl.[6] B60C *23/00*
U.S. Cl. 340—443 **1 Claim**



1. A new and improved tire pressure warning system for use under a frame of a tandem axle vehicle comprising:

a left front leaf spring, a right front leaf spring, a left rear leaf spring, and a right rear leaf spring, each leaf spring having a front end, a rear end, and an intermediate portion therebetween, the intermediate portions of the left and right front leaf springs adapted to be aligned with and coupled to a front axle having inflatable tires disposed thereon, the intermediate portions of the left and right rear leaf springs adapted to be aligned with and coupled to a rear axle having inflatable tires disposed thereon, the front ends of the right front and left front leaf springs and the rear ends of the right rear and left rear leaf springs adapted to be offset and coupled to the frame of a tandem axle vehicle;

a left and a right equalizer bar, each equalizer bar having an elongated and generally rectangular shape and an upper surface, a lower surface, a leading edge, a trailing edge, a central axis defined between the leading and trailing edges, and a cross axis defined perpendicular to the central axis, the left equalizer bar disposed between and offset below the rear end of the left front leaf spring and front end of the left rear leaf spring, the right equalizer bar disposed between and offset below the rear end of the right front leaf spring and the front end of the right rear leaf spring, the leading edge of the left and right equalizer bars facing the left front and right front leaf springs, respectively, and the trailing edge of the left and right equalizer bars facing the left rear and right rear leaf springs, respectively;

a left front link, a left rear link, a right front link, and a right rear link, the left front link pivotally coupled between the rear end of left front leaf spring and the left equalizer bar near the leading edge thereof, the left rear link pivotally coupled between the front end of left rear leaf spring and the left equalizer bar near the trailing edge thereof, the right front link pivotally coupled between the rear end of right front leaf spring and the right equalizer bar near the leading edge thereof, the right rear link pivotally coupled between the front end of right rear leaf spring and the right equalizer bar near the trailing edge thereof, the links enabling the equalizer bars to rotate about their central and cross axes when unequal load conditions exist on the leaf springs;

a left and a right support bar, each bar having an upper end and a lower end, the upper end of each bar adapted to be coupled to the frame of a vehicle, the lower end of the left support bar coupled to the left equalizer bar between the left front link and the left rear link, the lower end of the right support bar coupled to the right equalizer bar between the right front link and right rear link;

a left front mercury switch, a left rear mercury switch, a right front mercury switch, and a right rear mercury switch, each mercury switch further comprising an elongated, hollow, and sealed container having a first end and a second end, liquid mercury disposed within the container to flow between the first end and the second end thereof when tilted, and a terminal coupled to the second end to contact the liquid mercury, whereby when the mercury is contained in the first end, the mercury switch is disengaged, and when the mercury is contained in second end, the mercury switch is engaged, the left front mercury switch disposed upon the upper surface of the left equalizer bar with the second end of the switch positioned adjacent to the leading edge, the left rear mercury switch disposed upon the upper surface of the left equalizer bar with the second end of the switch positioned adjacent to the trailing edge, the right front mercury switch disposed upon the upper surface of the right equalizer bar with the second end of the switch positioned adjacent to the leading edge, and the right rear mercury switch disposed upon the upper surface of the right equalizer bar with the second end of the switch positioned adjacent to the trailing edge;

a plurality of wires adapted to carry electrical power from an external power source;

an upstanding planar rectangular indicator panel having an upper left corner, a lower left corner, an upper right corner, and a lower right corner, the indicator panel adapted to be coupled to the dashboard within a driver's compartment of a vehicle, the indicator panel further having an indicator circuit coupled thereto, the indicator circuit adapted to be coupled to an external power source, the indicator circuit further comprising:

a left front light coupled to the upper left corner of the indicator panel, a left rear light coupled to the lower left corner of the indicator panel, a right front light coupled to the upper right corner of the indicator panel, a right rear light coupled to the lower right corner of the indicator panel, and a central light coupled to the center of the indicator panel, the left front light electrically connected in series to the left front mercury switch with a wire, the left rear light electrically connected in series to the left rear mercury switch with a wire, the right front light electrically connected in series to the right front mercury switch with a wire, the right rear light electrically connected in series to the rear mercury switch with a wire, the central light electrically connected in parallel to the left front light with a wire, the left rear light with a wire, the right front light with a wire, and the right rear light with a wire, the left front light, the left rear light, the right front light, and the right rear light adapted to provide an indication of lost pressure in a given tire, the central light adapted to provide a indication of lost pressure in any of the tires, and

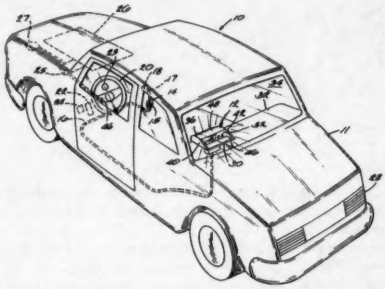
a controller switch operable in one orientation to energize the indicator circuit and in another orientation to de-energize the indicator circuit, whereby when the tire pressure warning system is coupled to a vehicle and energized, and a tire on the vehicle loses pressure, the equalizer bar rotates about its central and cross axes due to the unequal load conditions on the tires, causing the mercury switch located in the direction of equalizer bar rotation to engage and activate the central light and one of the lights positioned in one of the corners on the indicator panel.

5,486,808

EXTERNAL CRUISE CONTROL WARNING LIGHT

Benjamin J. Nejdl, Palatine, Ill., assignor to Safe-Lite, Inc., Palatine, Ill.

Filed Apr. 19, 1993, Ser. No. 49,104
Int. Cl.[6] B60Q *1/00*
U.S. Cl. 340—464 **14 Claims**



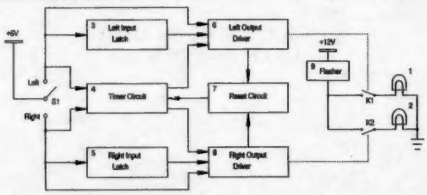
1. A kit for a vehicle having a rear window, an internal combustion engine, an operator, an electrical system and means for the operator to maintain the speed of the vehicle fixed at any operator selectable speed, said kit comprising a light mounted immediately in front of said rear window, said light having lettering indicating said speed maintenance means is operable when said light is activated, an electric cable connected to said light, and operator controllable means for connecting the electric cable to said vehicle electrical system to create an electric circuit to activate said light, said operator controllable means comprising electrical relay means, said electrical relay means comprising means for sensing said speed maintenance means is activated and switch means for connecting said light to said electrical system, whereby when said light is activated by connecting said electric cable to said vehicle electrical system persons outside of the vehicle are advised the speed of the vehicle is being maintained at a fixed rate.

5,486,809

LEVER-TAP-ACTIVATED TIMED TURN SIGNALING

Ben Wadlington, Jr., Rt. 2, Box 913-A, Adkins, Tex. 78101

Filed Jun. 6, 1994, Ser. No. 254,518
Int. Cl.[6] B60Q *1/40*
U.S. Cl. 340—477 **9 Claims**



1. An apparatus for providing momentary-activation-defined durations of motor vehicle turn signaling in a turn signal system having a means for selecting either left or right, and either momentary or latched signal activations, said apparatus comprising:

means for detecting said momentary activations of said selecting means of said turn signal system;

means for counting and maintaining a count total of said momentary activations;

means for timing successive pre-determined lengths of time, said timing means becoming operative when said count total is non-zero, said timing means decrementing said count total upon a passage of each successive pre-determined length of time;

means for detecting a right or left direction of said momentary activations;

a first switching means for conducting pulsed battery current to a right signal lamp, said first switching means conducting said pulsed current when said selecting means of said turn signal system is in a right activation position, said first switching means also conducting said pulsed current when said means for timing successive pre-determined lengths of time is operative and said direction detecting means indicates a right direction for a last momentary activation;

a second switching means for conducting pulsed battery current to a left signal lamp, said second switching means conducting said pulsed current when said selecting means of said turn signal system is in a left activation position, said second switching means also conducting said pulsed current when said means for timing successive pre-determined lengths of time is operative and said direction detecting means indicates a left direction for a last momentary activation;

means for blocking a count of a momentary activation when said timing means is operative and said means for detecting a right or left direction of said activation detects a direction different from a last direction detected;

means for deactivating said means for timing and for resetting said count total to zero when said selecting means of said turn signal system is latched or momentarily activated in a direction different from a last direction detected by said direction detecting means; and

means for generating an audible signal upon each count of a momentary activation.

5,486,810

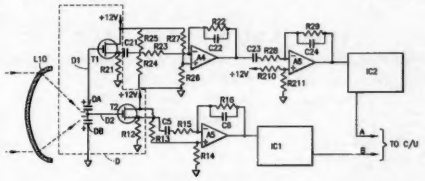
INFRARED DETECTOR FOR DETECTING MOTION AND FIRE AND AN ALARM SYSTEM INCLUDING THE SAME

Frank Schwarz, 156 Thunderhill Dr., Stamford, Conn. 06902

Division of Ser. No. 12,432, Feb. 2, 1993. This application Dec. 13, 1994, Ser. No. 355,060

Int. Cl.[6] G08B *19/00;13/18;17/12*

U.S. Cl. 340—521 **7 Claims**



1. A detector which detects motion and changes in ambient temperature comprising:

a) a first passive infrared sensor and a second passive sensor, said first and second passive sensors coupled to each other in phase opposition and providing a first output;

b) first circuit means coupled to said first output for providing an intrusion alarm when infrared radiation detected by said first passive infrared detector differs from said second passive infrared detector according to first criteria; and

c) second circuit means coupled to said first passive infrared sensor at a common connection between said first and second passive infrared sensors for providing an ambient temperature change alarm when said first passive infrared sensor detects a change in infrared radiation that exceeds a predetermined amount over a predetermined time.

5,486,811

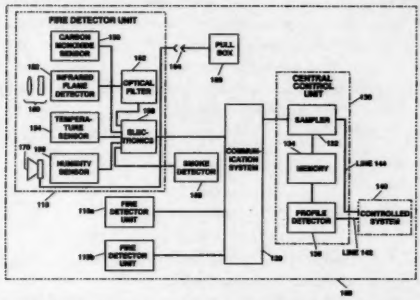
FIRE DETECTION AND EXTINGUISHMENT SYSTEM

John P. Wehrle, Greenbelt, Md.; Ernest A. Dahl, Ventura, Calif., and James R. Lugar, Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1994, Ser. No. 193,984

Int. Cl.[6] G08B *19/00*

U.S. Cl. 340—522 **9 Claims**



1. A fire detection and extinguishment system for detecting and extinguishing early stage fires in a protected space, comprising:

at least one fire detector unit including at least a carbon monoxide sensor and a radiation sensitive flame detector, said at least one fire detector unit associated with a localized portion of a protected space;

a central control unit including at least a sampler for periodically receiving data measured by at least said carbon monoxide sensor and said radiation sensitive flame detector, a memory for storing said received data and a profile detector responsive to said stored data, said memory storing therein said received data in the form of time profiles of variations of said data measured over a period of time by at leas‹ said carbon monoxide sensor and said radiation sensitive flame detector, said memory further having stored therein known data indicative of early stages of a fire, said known data corresponding to said data measured by at least said carbon monoxide sensor and said radiation sensitive flame detector, wherein said profile detector compares said measured data with said corresponding known data;

a communication system for communicating between said at least one fire detector unit and said central control unit; and

a controlled fire extinguishment system responsive to said central control unit, wherein said controlled fire extinguishment system includes at least one localized fine water mist supply and distribution system functioning to absorb heat produced by early stage fires, a central water supply for supplying pressurized water, at least one water supply main for transporting said pressurized water from said central water supply to said at least one localized fine water mist supply and distribution system, and at least one valve responsive to said central control unit for activating a flow of said pressurized water to said at least one localized fine water mist supply and distribution system, wherein said flow of pressurized water is supplied at a pressure of approximately 250 psi, said at least one localized fine water mist supply and distribution system responsive to one or more of said at least one fire detector unit and positioned within a localized portion of a protected space associated with said one or more of said at least one fire detector unit, and further said at least one localized fine water mist supply and distribution system including a plurality of distribution branches, a plurality of water mist nozzles mounted on each of said distribution branches, a supply riser and a distribution manifold for providing said pressurized water to said plurality of distribution branches, said nozzles being spaced at approximately 16 inch intervals on said distribution branches, said distribution branches being spaced at approximately four foot intervals along said distribution manifold, wherein said at least one fine water mist supply and

distribution system provides a controlled distribution of fine water mist comprising water particles having diameters of about 100 microns at a water distribution density of about 0.05 gallons per minute for each square foot of protected area within said localized portion of a protected space associated with said at least one fire detector unit,

wherein upon said profile detector detecting a correlation between said measured data and said corresponding known data said central control unit activates said localized fine water mist supply and distribution system for providing said controlled distribution of fine water mist, said controlled distribution of fine water mist providing a large surface area of water particles for transferring heat out of early stage fires such that fire progression is halted.

5,486,812

SECURITY ARRANGEMENT

Robert E. Todd, Blythe, Great Britain, assignor to Cedardell Limited, Hexham, United Kingdom

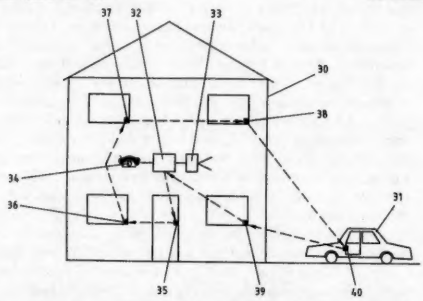
PCT No. PCT/GB91/00160, § 371 Date Oct. 26, 1992, § 102(e) Date Oct. 26, 1992, PCT Pub. No. WO91/14245, PCT Pub. Date Sep. 19, 1991

PCT Filed Feb. 4, 1991, Ser. No. 927,651

Claims priority, application United Kingdom, Mar. 3, 1990, 9004828; Jan. 18, 1990, 9022698

Int. Cl.[6] G08B *1/08*

U.S. Cl. 340—539 **13 Claims**



1. A building security arrangement comprising a control module, an alarm and a multiplicity of stations, at least one station including a lock, wherein each lock is arranged to be actuated upon receipt of a control signal from the control module and wherein said stations include a detector adapted to provide a status signal indicative of a status of the station, a radio frequency transceiver for transmitting and receiving control signals from the control module, and a control signal modifier for modifying the control signal received by the station, the control module being arranged to actuate the alarm upon detection of a predetermined status of a station, whereby the stations are successively interrogated by the control module, and wherein at least one station is arranged to receive a control signal from a first adjacent station, to modify said control signal to indicate the status of the station, and to transmit the control signal to a second adjacent station.

5,486,813

Patent Not Issued For This Number

5,486,814

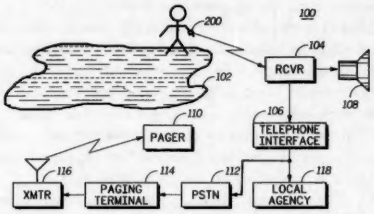
BABY POOL GUARD ALARM

Sandra L. Quinones, 111 Canterbury Dr. W., West Palm Beach, Fla. 33407-1510

Filed Oct. 11, 1994, Ser. No. 321,144

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—573 **5 Claims**



1. A fail safe alarm control device for detecting entry into body of water, including a swimming pool, the alarm control device being powered by a power source and the alarm control device comprising:

a device body;

means for attaching said device body to a portion of a human body;

an underwater sensor disposed in said device body for sensing a water condition when said device body is submerged in water;

a radio transmitter disposed within said device body, said radio transmitter receiving power from the power source to maintain a condition wherein said radio transmitter is normally transmitting a coded signal, unless said radio transmitter is deactivated in response to detection of a water condition by said underwater sensor, or unless said radio transmitter is deactivated in response to failure of the power source;

a receiver for receiving said coded signal from said radio transmitter; and

an alarm means that is activated in response to interruption in reception of said coded transmission from said radio transmitter to said receiver, whereby a failure in reception of said coded transmission is automatically detected.

5,486,815

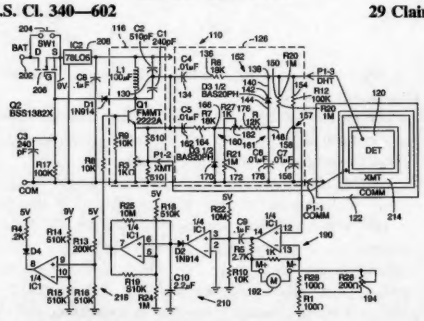
MOISTURE DETECTION CIRCUIT

Edward D. Wagner, Rogue River, Oreg., assignor to Wagner Electronic Products, Inc., Rogue River, Oreg.

Filed Jan. 26, 1993, Ser. No. 9,274

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—602 **29 Claims**



1. A moisture detector comprising:

an oscillator having an AC signal output;

a common electrode;

a detector electrode for placing in proximity to an object such that an impedance between the detector electrode and the common electrode is related to a moisture content of the object;

a first capacitor and a first resistor connected in series between the AC signal output of the oscillator and the detector electrode for driving the detector electrode with an AC signal which is affected by the impedance between the detector electrode and the common electrode such that a voltage level of the AC signal is thereby related to the moisture content of the object; and

a first diode connected between the detector electrode and a reference voltage node, whereby the voltage at the detector electrode is level shifted relative to a reference voltage at the reference voltage node.

5,486,816

FIRE DETECTOR HAVING OPTIC BASE CLAMPING OPTIC ELEMENTS TO A CIRCUIT BOARD

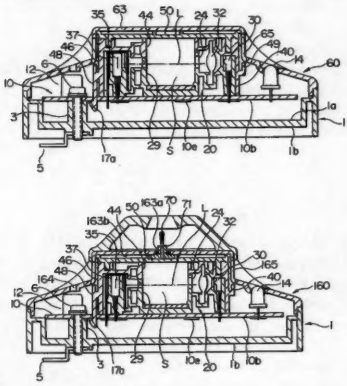
Yasuo Ariga, and Eiji Hirooka, both of Tokyo, Japan, assignors to Nohmi Bosai Ltd., Tokyo, Japan

Filed Apr. 23, 1993, Ser. No. 51,689

Claims priority, application Japan, Apr. 25, 1992, 4-131536; Apr. 25, 1992, 4-131537

Int. Cl.[6] G08B *17/10;23/00;17/00;* **G01N** *15/06*

U.S. Cl. 340—630 **23 Claims**



1. A fire detector, comprising:

a detector body;

a printed circuit board fixed to said detector body, said printed circuit board having a plurality of insertion holes;

an optic base having a plurality of hooks at a lower end thereof and an annular labyrinth defined at an upper end thereof, said hooks being received in said insertion holes of said printed circuit board so as to fix said optic base to the upper surface of said printed circuit board;

an optic part holder mounted upon and directly contacting the upper surface of said printed circuit board, said optic base clamping said optic part holder to the upper surface of said printed circuit board to fix the optic part holder relative to said upper surface;

an optic base cover covering an upper end of said labyrinth of said optic base; and

a light-emitting element and a light-receiving element arranged in a pair on said optic part holder.

5,486,817

COMMUNICATION SYSTEM FOR VEHICLE CONTROL SYSTEM HAVING PRESETTABLE INITIAL STATE

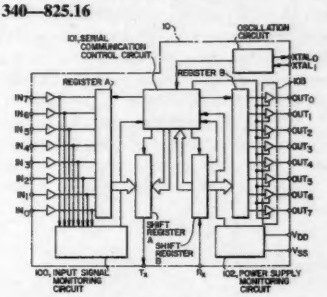
Katsuhiro Ina, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 701,169, May 17, 1991, abandoned. This application Jul. 26, 1993, Ser. No. 96,838

Claims priority, application Japan, May 21, 1990, 2-130526; Apr. 16, 1991, 3-084152

Int. Cl.[6] G05B *23/02*

U.S. Cl. 340—825.16 **8 Claims**



1. A communications system for a vehicle, comprising a sending station and a receiving station which are actuated by receiving an electric power supply from a battery mounted on the vehicle, said sending station and said receiving station being positioned at various places in the vehicle, wherein communication between the sending station and the receiving station is performed via a communication line, said receiving station comprising:

communication means for receiving a communication signal sent from said sending station via said communication line,

outputting means for performing drive control of a plurality of driven means in accordance with said communication signal when the communication signal is received by said communication means, and

continuity control means, provided between said communication means and said outputting means, to electrically connect and disconnect therebetween, for electrically separating said communication means from said outputting means to electrically disconnect therebetween by assuming a high impedance state between a time when supply of electric power supply voltage from said battery to the receiving station is started, until said communication means receives the communication signal from said sending station,

wherein said outputting means performs drive control of said plurality of driven means in a desired initial state independent of said communication signal when connection between said communication means and outputting means is electrically separated by means of said continuity control means.

5,486,818

WIRELESS SWITCH FOR A TELEMETRIC RECEIVER

Erkki Loponen, Mikkola, Finland, assignor to Polar Electro Oy, Kempele, Finland

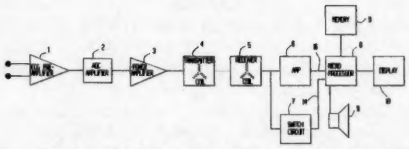
Continuation of Ser. No. 918,052, Jul. 24, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 340,479

Claims priority, application Finland, Jul. 26, 1991, 913599

Int. Cl.[6] G08C *19/06*

U.S. Cl. 340—870.31 **10 Claims**

1. A wireless switch for a telemetric receiver in a pulse meter, wherein the receiver receives a telemetric pulse measuring signal from a transmitter by means of an inductive coupling between the transmitter and the receiver, the wireless switch, comprising:



means for detecting the intensity of the telemetric pulse measuring signal inductively received in the telemetric receiver and for causing a pulse measuring function of the pulse meter to be activated in the receiver at times when the signal intensity exceeds a predetermined threshold value, the activated pulse measuring function being terminated by causing a second telemetric pulse measuring signal having an intensity exceeding said threshold value to occur in the inductance of the receiver at times when the pulse measurement function is active wherein the means for detecting the intensity of the telemetric pulse measuring signal includes the same inductance used by the receiver for the inductive coupling of the transmitter.

5,486,819

ROAD OBSTACLE MONITORING DEVICE

Ryuji Horie, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

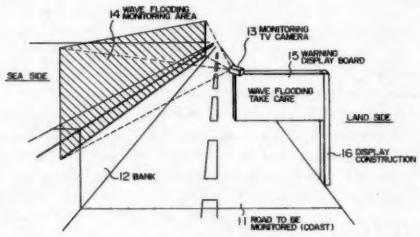
Continuation of Ser. No. 787,952, Nov. 5, 1991, abandoned. This application May 22, 1995, Ser. No. 447,083

Claims priority, application Japan, Nov. 27, 1990, 2-328665

Int. Cl.[6] G08G *1/09;* **H04N** *7/18*

U.S. Cl. 340—905 **12 Claims**

1. A system for monitoring selected road sections and for detect-



ing the occurrence of obstacles that occupy said selected road sections, said system comprising:

a road section imaging device for generating image data of a selected road section being monitored, said image data including reference image data of said selected road section having no obstacles and monitored image data of said selected road section when obstacles may be present;

an image processing device communicatively connected to receive said image data from said road section imaging device, said image processing device including means for detecting an obstacle based on detecting a frame difference between said reference image data and monitored image data;

means connected to said image processing device, for measuring physical dimensions of said detected obstacle and for generating an output signal when said physical dimensions of said obstacle exceed predetermined minimum physical dimension data; and

means communicatively connected to receive said output signal from said measuring means, for generating a warning display of said detected obstacle.

5,486,820

TRAFFIC SENSOR HAVING PIEZOELECTRIC SENSORS WHICH DISTINGUISH LANES

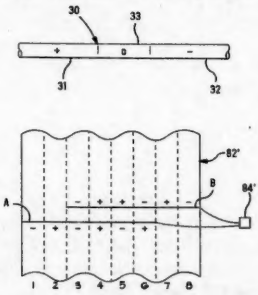
Joseph V. Chatigny, Wayne; Mitchell Thompson, Exton; Peter F. Radice, King of Prussia, and Donald L. Halvorsen, Phoenixville, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 18, 1992, Ser. No. 992,577

Int. Cl.[6] G08G *1/01*

U.S. Cl. 340—933 **28 Claims**

1. A traffic sensor for sensing the number of vehicles travelling



in each lane of a predetermined portion of a roadway, comprising:

a piezoelectric sensor stretched across a width of said predetermined portion of said roadway, said piezoelectric sensor generating an electrical signal when deflected by a vehicle, generated electrical signal having a first polarity when deflected by a vehicle in a first lane of said roadway and a second polarity when deflected by a vehicle in a second lane of said roadway; and

means for discriminating the polarity of said generated electrical signal and for determining from the respective polarities in which lane of said roadway said piezoelectric sensor has been deflected by one of the vehicles.

5,486,821

ARTIFICIAL HORIZON ALTITUDE WARNING SYSTEM

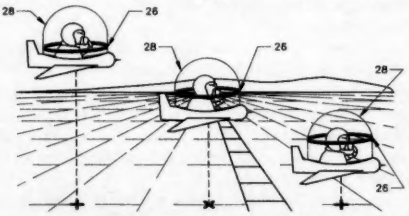
David E. Stevens, St. Louis, Mo., and Leonard A. Temme, Pensacola, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1994, Ser. No. 249,658

Int. Cl.[6] G08B *23/00*

U.S. Cl. 340—970 **18 Claims**

1. An artificial horizon warning system for an aircraft containing



an altitude measuring and or ground proximity devices which provides a warning when a controlled flight of the aircraft will result in a collision with the ground, said system comprising:

means for gathering altitude information about said aircraft from said altitude and proximity measuring device and generating an altitude signal;

laser light generating means for producing at least one ray of laser light in a cockpit of said aircraft; and

control means for receiving said altitude signal and for positioning one ray of said light in said cockpit to form an artificial line based on said altitude signal, said artificial line being positioned so as to be disposed along an arcuate length corresponding to the location of an actual horizon as viewed by a pilot of said aircraft wherein said artificial line is disposed at the intersection of said one ray of said light and said cockpit, said one ray of light being defined by a visual horizon, angle, said visual horizon angle being defined by:

$$x = \sin^{-1}\left[\frac{R}{A+R}\right]$$

where, x is said visual horizon angle, R is the radius of the earth, and A is the altitude of said aircraft, said visual horizon angle being measured from a line extending from a pilot's eye to the horizon and from said pilot's eye to the center of the earth.

5,486,822

OPTIMUM ROUTE DETERMINATION

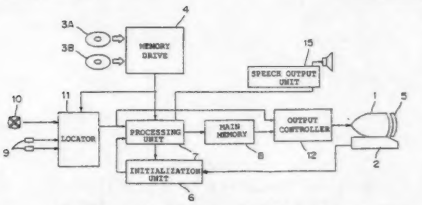
Kenji Tenmoku; Takuya Inoue, and Takeo Hashimoto, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 786,843, Nov. 1, 1991, abandoned. This application May 26, 1994, Ser. No. 250,105

Claims priority, application Japan, Nov. 9, 1990, 2-305017; Nov. 10, 1990, 2-305020

Int. Cl.[6] G08G *1/123*

U.S. Cl. 340—995 **13 Claims**



1. In an optimum route determination apparatus which, according to a destination set by a vehicle operator, reads road map data of an area containing a departure point and that destination out of a road map memory for a road map and which determined an optimum route leading from the departure point to the destination based on the road map data, selection means exterior to said optimum route determination apparatus having previously selected a plurality of specific points, calculation means exterior to said optimum route determination apparatus having previously calculated a plurality of optimum routes which lead from said plurality of specific points to a plurality of destinations, respectively, passing in sequence through specific points and each specific point representing at least one departure point in a respective optimum route, said optimum route determination apparatus comprising:

a route memory having stored therein a route table containing data of said specific points, data of said destinations and data of a plurality of initial routes, one of said initial routes leading from one of said specific points to at least the next specific point in said sequence positioned on one of said optimum routes leading from said one of said specific points to one of said destinations, and not including all specific points comprising the optimum route to a respective destination, wherein said data of said data of said specific points, said data of said destinations and said data of said initial routes are contained in said route table in such a manner that the data of said one of said initial routes is acquired by searching said route table for said one of said specific points and one of said destinations;

initialization means for setting one of said destinations and one of said specific points near to a current location of a vehicle; and

initial route acquisition means for searching said route table for the specific point and the destination set by said initialization means to acquire said data of said initial route,

said initialization means then replacing said one of said specific points with the next specific point, said initial route acquisition means and said initialization means then repeating the searching and replacing operations until one of said optimum routes is constituted by the repeatedly acquired initial route data.

5,486,823

KEYBOARD SYSTEM CAPABLE OF ALLOWING SINGLE-HAND INPUT OPERATION

Wen-Hung Tsai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

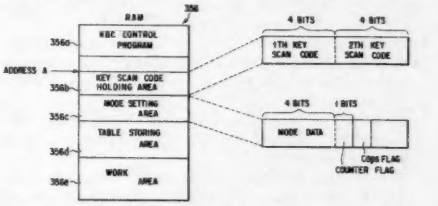
Filed Jan. 7, 1994, Ser. No. 178,752

Claims priority, application Japan, Jan. 14, 1993, 5-004878

Int. Cl.[6] H03K *17/94;* **G06F** *3/00*

U.S. Cl. 341—22 **12 Claims**

1. A keyboard system connected to a computer system and



having a plurality of keys, comprising:

generating means for detecting depression of an arbitrary key included in the plurality of keys to generate a key scan code corresponding to the depressed key;

first holding means for holding data having a size twice that of the key scan code generated by said generating means and system scan code supplied to said computer system in correspondence with the key scan code;

second holding means, coupled to said generating means, for holding the key scan code generated by said generating means;

determining means, coupled to said second holding means, for checking whether the key scan code is held in said second holding means;

first control means, coupled to said generating means, for checking in accordance with the key scan code generated by said generating means whether a specific key is depressed and executing a process pre-assigned to the specific key upon determining depression of the specific key; and

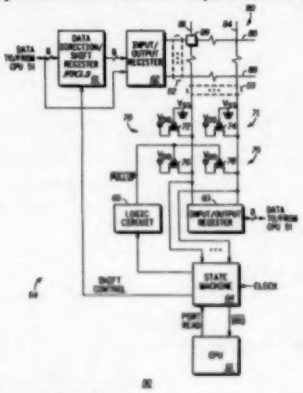
second control means, coupled to said second holding means and said determining means, for, when said determining means determines that the key scan code is already held in said second holding means, and a next key scan code is generated by said generating means, defining, as first data, data having a size twice that of a single key scan code and constituted by the next key scan code generated by said generating means and the key scan code already held in said second holding means, detecting one of the system scan codes, corresponding to the first data stored in said first holding means, and sending the system scan code to said computer system.

5,486,824
DATA PROCESSOR WITH A HARDWARE KEYSCAN CIRCUIT, HARDWARE KEYSCAN CIRCUIT, AND METHOD THEREFOR

Keith E. Kinerk; Hoang K. Quan, and Joseph P. Magliocco, all of Austin, Tex., assignors to Motorola, Inc., Schumburg, Ill.

Filed Oct. 5, 1994, Ser. No. 318,301
Int. Cl.[6] H03K *17/94*
U.S. Cl. 341—26 **20 Claims**

1. A data processor with a hardware keyscan circuit, comprising:



a central processing unit;

a first register coupled to said central processing unit and to a first port for being coupled to a plurality of rows of a keypad matrix;

a second register coupled to said central processing unit and to a second port for being connected to a plurality of columns of said keypad matrix;

a first plurality of pullup elements coupled to corresponding ones of said plurality of columns, said first plurality of pullup elements characterized as being continuously conductive;

a second plurality of pullup elements coupled to corresponding ones of said plurality of columns, said second plurality of pullup elements characterized as being conductive in response to a pullup signal; and

a pullup control circuit having an input coupled to said second register, and an output coupled to said second plurality of pullup elements for activating said pullup signal in response to a change of logic state of at least one of said plurality of columns.

5,486,825
CONVOLUTIONAL ENCODERS FOR MODEMS WHICH IMPLEMENT THE "COLE CODE"

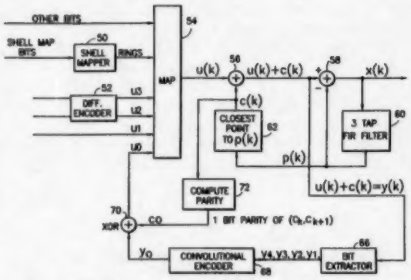
Paul D. Cole, Fairfield, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Filed Apr. 20, 1994, Ser. No. 230,682
Int. Cl.[6] H03M *7/00*
U.S. Cl. 341—50 **16 Claims**

1. A sixty-four state convolutional encoder for a non-systematic encoder of a modem, said sixty-four state convolutional encoder receiving at least three inputs p(n), r(n) and s(n), and having a current state, comprising:

a) state means for storing the current state of the convolutional encoder, the current state being defined by six state variables, said six state variables being r(n−1), r(n−2), s(n−1), s(n−2), p(n−1), and x(n−1), where x(n−1) is equal to the sum of p(n−2) plus a first variable, where the first variable is zero when said at least three inputs constitutes exactly three inputs;

b) means for updating the current state of the convolutional encoder to a new state by updating said six state variables from old values to new values, where the new value for state variable r(n−1) is the old value of input r(n), the new value for



state variable r(n−2) is the old value of state variable r(n−1), the new value for state variable s(n−1) is the old value of input s(n), the new value for state variable s(n−2) is the old value of state variable s(n−1), the new value for state variable p(n−1) is the old value for input p(n), and the new value for state variable x(n−1) is equal to the sum of the old value for state variable p(n−1) plus a second variable, where the second variable is zero when said at least three inputs constitute exactly three inputs; and

c) means for generating at least four outputs $y_3(n)$, $y_2(n)$, $y_1(n)$, and $y_0(n)$ from said six state variables of said current state and from said at least three inputs according to at least four output equations

$$y_3(n)=p(n)+r(n)r(n-1)+r(n-2)+r(n-1)s(n)+r(n-1)s(n-2)$$

$$y_2(n)=r(n-1)+s(n)+s(n-2)$$

$$y_1(n)=r(n)+r(n-1)r(n-2)+p(n-1)+p\ (n-2)+q(n-1)$$

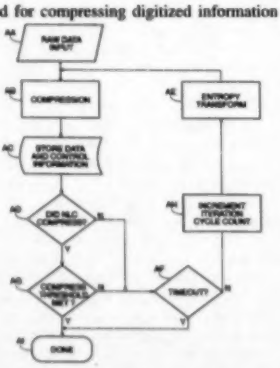
$$y_0(n)=s(n-1).$$

5,486,826
METHOD AND APPARATUS FOR ITERATIVE COMPRESSION OF DIGITAL DATA

John F. Remillard, Boulder, Colo., assignor to PS Venture 1 LLC, Cheyenne, Wyo.

Filed May 19, 1994, Ser. No. 246,014
Int. Cl.[6] H03M *7/30*
U.S. Cl. 341—51 **20 Claims**

1. A method for compressing digitized information comprising



the steps of:

a) storing input digital information in a first storage means;

b) applying a compression process in a compressor means to the stored input digital information to obtain first information bit sets and a first control/data set about the first information bit

sets, said first information bit sets intended to be a reduced number of information bit sets compared to said input digital information, and storing said first information bit sets and said first control/data set in a second storage means as first processed data; thereafter

c) testing said first processed data in comparison to said input digital information to determine if total information storage requirements have been reduced; and if so

d) testing said first processed data against a compression threshold; and, if the compression threshold is not met,

e) applying an entropy transformation on said first processed data to obtain transformed data; thereupon

f) storing as output information at least said transformed data in a third storage means as a representation of processed information;

g) repeating step b) with said representation of processed information as said stored input digital information; and

h) repeating steps c) through g) until no further compression is desired.

5,486,827

EFM MODULATOR FOR CONTROLLING DIGITAL SUM VARIATION OF ENCODED DATA

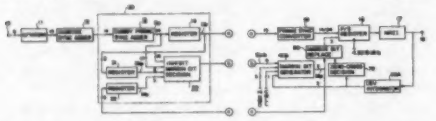
Kazutoshi Shimizume, and Shinobu Nakamura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 18, 1993, Ser. No. 136,949

Claims priority, application Japan, Jan. 22, 1992, 4-284319

Int. Cl.[6] H03M *5/00*

U.S. Cl. 341—58 **3 Claims**



1. A modulator for converting input m bit code series to n channel bit patterns (where n>m) which are linked to each other with one of a plurality of margin bit patterns to limit maximum and minimum recording wavelengths and suppress a low-frequency component of a recording waveform, comprising:

means for receiving:

an inhibit signal indicating which of said plurality of margin bit patterns are to be inhibited;

a level signal representing a final level of a modulated signal waveform for each of said n channel bit patterns, said n channel bit patterns being positioned before each of said plurality of margin bit patterns;

a polarity signal indicating a polarity of a cumulative digital sum variation;

a control signal indicating a magnitude of an absolute value of said cumulative digital sum variation;

a variation signal indicating said cumulative digital sum variation of each of said n channel bit patterns to be placed after each of said plurality of margin bit patterns; and

margin bit generating means for selecting a margin bit pattern most suitable for controlling said cumulative digital sum variation from among said plurality of margin bit patterns based on said inhibit, level, polarity, control and variation signals.

5,486,328

CODING/DECODING METHOD AND APPARATUS THEREFOR

Fumiyuki Mikami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 27,581, Mar. 5, 1993, which is a continuation of Ser. No. 504,623, Apr. 4, 1990. This application Dec. 17, 1993, Ser. No. 169,539

Claims priority, application Japan, Apr. 6, 1989, 1-85659; Jul. 18, 1989, 1-183582

Int. Cl.[6] H03M *7/00*

U.S. Cl. 341—59 **9 Claims**

1. A method for outputting optimized digital data in a form

DATA WORD		CODE WORD
A	a	(10000)
B	b	(01000)
C	c	(00100)
D	d	(00010)
BA	af	(10000 00000)
CA	bf	(01000 00000)
CB	cf	(00100 00000)
DA	df	(00010 00000)
DB	ef	(00001 00000)
BBA	aff	(10000 00000 00000)
CCA	bff	(01000 00000 00000)
DCA	cff	(00100 00000 00000)
DCB	dff	(00010 00000 00000)
DCC	eff	(00001 00000 00000)
DCD	eef	(00001 00001 00000)
BBBA	aeff	(00001 00001 00000 00000)
CCCA	eeef	(00001 00001 00001 00000)
DDCA	efff	(00001 00000 00000 00000)

which facilitates at least one of storage of said optimized digital data on a recording medium and transmission of said optimized digital data to a remote location, comprising the steps of:

providing an input means for inputting digital data;

providing a processing means for processing the input digital data input by the input means by encoding binary data into 5-bit code word for every 2-bit binary data (data word), in order to record digital data in a recording medium or transmit digital data; and

providing an output means for outputting data processed by the processing means the encoding step comprising the steps of;

(a) inputting a plurality of data words by said input means,

(b) transferring a series of four data words of 8 bits length of said plurality of data words to said processing means,

(c) discriminating whether or not said series of four data words correspond with a first data array, and if it is discriminated by said processing means that said series of four data words correspond with the first data array, encoding said series of four data words into predetermined four code words of 20 bits length by said processing means and transferring said four code words to said output means,

(d) if it is discriminated by said processing means that the series of four data words do not correspond with the first data array in step (c), discriminating whether or not a series of three data words of 6 bits length correspond with a second data array by said processing means, and if it is discriminated by said processing means that said series of three data words correspond with the second data array, encoding said series of three data words into predetermined three code words of 15 bits length by said processing means and transferring said three code words to said output means,

(e) if it is discriminated by said processing means that said series of three data words do not correspond with the second data array in step (d), discriminating whether or not a series of two data words of 4 bits length correspond with a third data array by said processing means, and if it is discriminated by said processing means that said series of two data words correspond with the third data array, encoding said series of two data words into predetermined two code words of 10 bits length by said processing means and transferring said two code words to said output means, and

(f) if it is discriminated by said processing means that the series of two data words do not correspond with the third data array in step (e), encoding one data word into a predetermined 5-bit code word, in accordance with a type of the 2-bit data word by said processing means and transferring said 5-bit code word to said output means,

wherein a number of bit "0" between bit "1" and bit "1" is from four to nineteen, whereby said 2-bit binary data input by said input means is encoded into 5-bit code word and output.

5,486,829

METHOD OF COMMUNICATING INFORMATION BETWEEN AN S-MODE SECONDARY RADAR AND A TARGET

Eric Potier, Velizy, and Michel Wybierala, Versailles, both of, France, assignors to Thomson-CSF, Paris, France

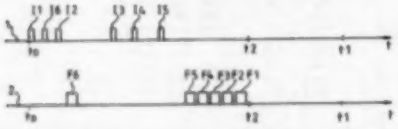
Filed Jul. 8, 1994, Ser. No. 271,991

Claims priority, application France, Jul. 9, 1993, 93 08474

Int. Cl.[6] G01S *13/76*

U.S. Cl. 342—40 **7 Claims**

1. A method of communicating data between a transmission/



reception center and a target, said data including transactions each of which consists of an interrogation pulse transmitted by said transmission/reception center and a reception window transmitted by said transmission/reception center which receives a response transmitted by said target, said method comprising the steps of:

(a) transmitting a plurality of interrogation pulses; and

(b) transmitting a plurality of reception windows such that a reception window corresponding to a latest-transmitted interrogation pulse is transmitted immediately after said latest-transmitted interrogation pulse and the reception windows corresponding to the interrogation pulses transmitted before said latest-transmitted interrogation pulse are then transmitted in a reverse order to an order in which the interrogation pulses to which they correspond were transmitted, unless any of said reception windows overlaps any of said interrogation pulses in which case the reception window which overlaps the interrogation pulse and its corresponding interrogation pulse are transmitted at the earliest time for which no overlap occurs.

5,486,830

RADAR TRANSPONDER APPARATUS AND SIGNAL PROCESSING TECHNIQUE

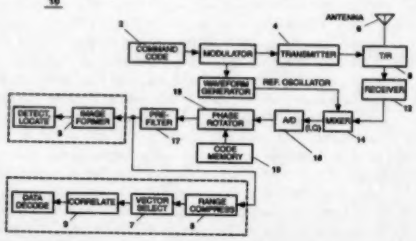
Robert M. Axline, Jr.; George R. Sloan, and Richard E. Spalding, all of Albuquerque, N.M., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 6, 1994, Ser. No. 223,799

Int. Cl.[6] G01S *13/74*

U.S. Cl. 342—43 **33 Claims**

14. An rf transponder recognition and identification system



comprising:

a) an rf transponder (tag) for receiving, modulating, and retransmitting rf pulses transmitted to said tag by a synthetic-aperture radar means, wherein said tag means is capable of amplitude-gating and phase-coding its echo with a number of prescribed and/or informational pulse sequences for retransmission to said synthetic-aperture radar means, said tag further comprising:

i) radar signal receiving means for receiving an illuminating signal from said SAR;

ii) frequency conditioning means coupled to said radar signal receiving means for phase-shifting said illuminating signal into a phase-shifted tag signal;

iii) transmitting means for transmitting rf signals to said SAR;

iv) code generator means for generating a prescribed code sequence for transmission to said SAR through said transmitting means;

v) tag status means coupled to said code generator means for providing identifying, environmental and 'status information of said tag to said SAR through said transmitting means; and

vi) mixing means, incorporated as part of said code generator means, for combining said prescribed sequence with said status information to produce a sequence having a combination of prescribed and informational content to be sent by said transmitting means to said airborne SAR; and

b) a synthetic-aperture radar (SAR) located on an airborne platform said SAR comprising:

i) illumination signal means for transmitting illuminating signals toward a ground surface from an airborne platform;

ii) rf receiving means for receiving radio frequency echo signals after said SAR transmits said illuminating signals to said surface;

iii) first signal-processing means coupled to said rf receiving means wherein echo signals are processed and demodulated using prescribed modulation sequences stored in a code-memory means and wherein prescribed modulation sequences, stored in a code memory means, identical to that used by said tag are mixed against echoes received by said rf receiving means providing processing of incoming tag echoes also received by said receiving means with said radio frequency echo signals reflected from said surface; and

iv) code memory means coupled to said first signal processing means for storing said modulation sequences;

wherein the total echo signal returned to said synthetic-aperture radar is processed by said processing in combination with additional standard image-formation processing of the echoes of at least one transponder apparatus, and resulting in the significant suppression of unwanted echoes due to clutter echo from stationary, natural or cultural targets located in proximity to said at least one transponder apparatus.

5,486,831

MULTI-MODE MISSILE SEEKER WITH ADJUNCT SENSOR BLOCKING AN ELECTRONICALLY SCANNED RADIO FREQUENCY APERTURE USING AN OFF-BORESIGHT DIRECTION FINDING PROCESS

Landon L. Rowland, Rte. 4, Box 75070, McKinney, Tex. 75070; Richard K. Lowder, #8 Creek Ski Lake, Rte. 4, Sherman, Tex. 75429; Lester W. Dyer, 3301 Snidow Ct., Plano, Tex. 75025-5362, and Charles H. Turner, 120 Forest Hollow, Argyle, Tex. 76126

Continuation of Ser. No. 231,008, Apr. 21, 1994, abandoned. This application Apr. 12, 1995, Ser. No. 420,616

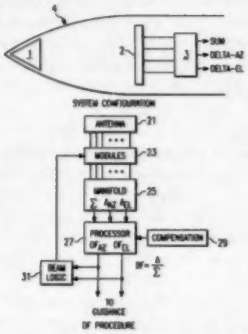
Int. Cl.[6] G01S *13/44;13/72*

U.S. Cl. 342—62 **21 Claims**

1. A multi-mode seeker having a boresight which comprises:

(a) a housing having a nose region;

(b) an impediment to transmission of electromagnetic radiations disposed in said nose region along said boresight of said seeker;



(c) a stationary antenna disposed along said boresight and rearward of said impediment to transmission of electromagnetic radiations relative to the direction of radiations to and/or from said antenna, said impediment blocking transmissions along said boresight to and from said antenna, said antenna having a field of regard having an axis disposed along said boresight and capable of scanning each one of plural fields of view within said field of regard; and

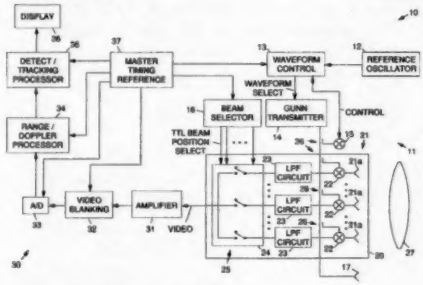
(d) electronic circuitry to cause said antenna to select one of said fields of view to scan responsive to said radiations received by said antenna.

5,486,832

RF SENSOR AND RADAR FOR AUTOMOTIVE SPEED AND COLLISION AVOIDANCE APPLICATIONS

Garry N. Hulderman, Riverside, Calif., assignor to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Jul. 1, 1994, Ser. No. 269,729
Int. Cl.[6] G01S *13/91*
U.S. Cl. 342—70 **16 Claims**



1. Radar apparatus comprising:

a millimeter wave FMCW radar transmitter comprising a single flood beam antenna;

a radar signal processor for processing radar return signals to produce radar output signals; and

an RF sensor comprising a receive antenna that includes:

a plurality of antenna elements;

a plurality of mixers respectively coupled to outputs of the plurality of antenna elements and coupled to the transmitter by means of a coupler;

a plurality of filter circuits respectively coupled to outputs of the plurality of mixers;

a multiplexer coupled to outputs of the plurality of filter circuits that comprises a multiple input, single output switch for sequentially outputting video signals derived from radar signals received by each of the receive antenna elements, and wherein the single output of the multiplexer is coupled to the radar signal processor for providing the radar return signals thereto; and

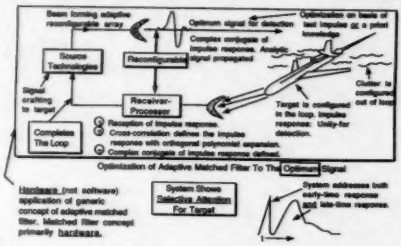
a lens for imaging radar returns onto each of the plurality of antenna elements.

5,486,833

ACTIVE SIGNALLING SYSTEMS

Terence W. Barrett, 1453 Beulah Rd., Vienna, Va. 22182

Filed Apr. 2, 1993, Ser. No. 42,272
Int. Cl.[6] G01S *7/42;7/32*
U.S. Cl. 342—204 **22 Claims**



1. A signalling system for detecting targets in a given medium, comprising:

means for generating and transmitting in said given medium a time-frequency wave packet which is the complex (phase) conjugate of the impulse response of the combined medium and target, and

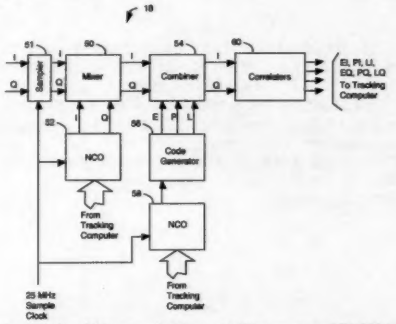
means for solving the wave equation for transmissions through said medium, reflectance from said target and transmission back through said medium.

5,486,834

GLOBAL ORBITING NAVIGATION SATELLITE SYSTEM RECEIVER

Gary R. Lennen, San Jose, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Aug. 8, 1994, Ser. No. 287,187
Int. Cl.[6] G01S *5/02;* H04J *1/02*
U.S. Cl. 342—357 **8 Claims**



1. A global orbiting navigation satellite system (GLONASS) navigation receiver, comprising:

a radio frequency (RF) down-conversion section having a RF input to receive microwave radio transmissions from orbiting GLONASS satellites and a pseudo-baseband output in which a plurality of GLONASS satellite carriers separated in frequency are mixed-down to a near baseband composite signal that exhibits a spectral fold-over;

a Nyquist sampling unit included in a final stage of the RF down-conversion section and operating in the range of twenty

to twenty-five MHz for generating in-phase (I) and quadrature-phase (Q) signals from said composite signal; and

a digital carrier mixer connected to receive said I and Q signals and having a programmable frequency that provides for a digital baseband selection among particular GLONASS satellites.

5,486,835

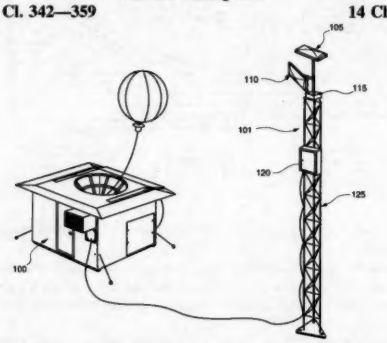
LOW COST TELEMETRY RECEIVING SYSTEM

Terrence F. Hock, Golden, Colo., assignor to University Corporation For Atmospheric Research, Boulder, Colo.

Filed Oct. 31, 1994, Ser. No. 331,808

Int. Cl.[6] H01Q *3/00*

U.S. Cl. 342—359 **14 Claims**



1. A low cost telemetry receiving system for receiving a telemetry signal of predetermined frequency from a wandering transmitter in airspace local to said telemetry receiving system, said telemetry receiving system comprising:

high gain antenna means having a receiving beam of narrow azimuthal and wide elevational view of space;

means for sensing the strength of said telemetry signal; and

means, responsive to said means for sensing, for positioning said antenna means to continuously receive said telemetry signal as said wandering transmitter traverses said airspace local to said telemetry receiving system.

5,486,836

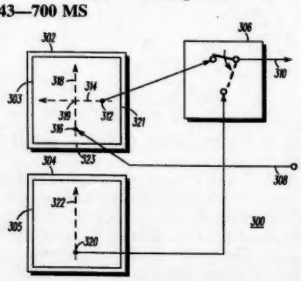
METHOD, DUAL RECTANGULAR PATCH ANTENNA SYSTEM AND RADIO FOR PROVIDING ISOLATION AND DIVERSITY

Stephen L. Kuffner, Algonquin; Scott N. Carney, Palatine, and Eric L. Krenz, Crystal Lake, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 16, 1995, Ser. No. 389,540

Int. Cl.[6] H01Q *1/38*

U.S. Cl. 343—700 MS **16 Claims**



1. A dual rectangular patch antenna system for providing isolation and diversity comprising:

A) a first rectangular patch antenna having a substantially planar conductive rectangular first patch with four coplanar sides, a first midline orthogonal to a first side, and a second midline parallel to the first side and intersecting the first midline at a center of the first patch, wherein the first patch includes:

Aa1) a first mode feedpoint, located on the first midline between the first side and the center of the first patch, for providing a first mode polarization, wherein the first mode feedpoint is connected to a transmit path; and

A2) a second mode feedpoint, located on the second midline between a second side, adjacent to the first side, and the center of the first patch, for providing a second mode polarization orthogonal to the first mode polarization, wherein the first mode feedpoint and the second mode feedpoint are located such that an isolation is provided by a voltage null of the first mode polarization along the second midline and a voltage null of the second mode polarization along the first midline;

B) a second rectangular patch antenna, spatially separated from the first rectangular patch antenna, having a substantially planar conductive rectangular second patch including a third mode feedpoint for providing a third mode polarization; and

C) a switch, operably coupled to select one of the second mode feedpoint of the first rectangular patch antenna and the third mode feedpoint of the second rectangular patch antenna based on a predetermined signal quality, for providing spatial diversity in a receive path.

5,486,837

COMPACT MICROWAVE ANTENNA SUITABLE FOR PRINTED-CIRCUIT FABRICATION

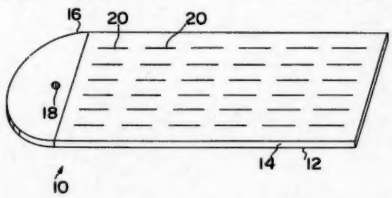
Lee S. Miller, 105 Windsor Ct., Central, S.C. 29630

Continuation of Ser. No. 16,531, Feb. 11, 1993, abandoned.

This application Dec. 21, 1994, Ser. No. 361,849

Int. Cl.[6] H01Q *13/00*

U.S. Cl. 343—780 **22 Claims**



1. A compact microwave antenna suitable for printed-circuit fabrication, comprising:

a guided wave structure supporting the propagation of surface guided waves;

a series of dipoles disposed relative to the surface of said guided wave structure, wherein said dipoles are excited by surface guided waves propagated along said guided wave structure, thereby generating a desired radiation field, and wherein the length and spacing of said dipoles are selected to achieve a desired angle of radiation from the surface of said guided wave structure and a desired radiation frequency; and

an excitation device disposed adjacent to said guided wave structure for exciting said guided wave structure with electromagnetic waves to generate surface guided waves so excite said series of dipoles.

5,486,838

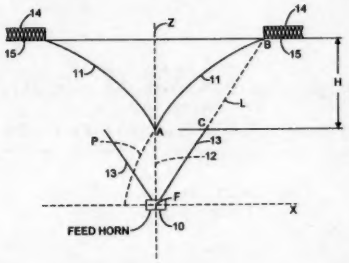
BROADBAND OMNIDIRECTIONAL MICROWAVE ANTENNA FOR MINIMIZING RADIATION TOWARD THE UPPER HEMISPHERE

Geza Dienes, Claremont, Calif., assignor to Andrew Corporation, Orland Park, Ill.

Continuation-in-part of Ser. No. 110,590, Aug. 23, 1993, abandoned. This application Apr. 19, 1994, Ser. No. 229,553

Int. Cl.[6] H01Q *19/14*

U.S. Cl. 343—781 R **17 Claims**



1. An omnidirectional microwave antenna comprising

a conical reflector having a reflecting surface defined by a cone having an axis and a surface of revolution around said axis, the line of intersection between said surface of revolution and a plane passing through said axis and said surface of revolution being a segment of a parabolic curve, said reflector including a flange extending outward from an outermost circumference of said surface of revolution of said cone, said flange having absorptive material mounted thereto, said flange being generally perpendicular to said axis of said cone, and

a conical feed horn located along said axis of said cone and having an aperture therein, the center of said aperture of said feed horn being located approximately at the apex of said cone, said absorptive material absorbing radiation emitted from said feed horn and bypassing said reflector.

5,486,839

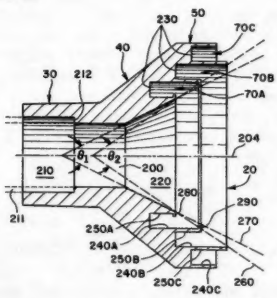
CONICAL CORRUGATED MICROWAVE FEED HORN

Charles E. Rodeffer, Burlington, Iowa; Edgar J. Denlinger, Princeton Junction, N.J., and Aly E. Fathy, Langhorne, Pa., assignors to Winegard Company, Burlington, Iowa

Filed Jul. 29, 1994, Ser. No. 282,787

Int. Cl.[6] H01Q *13/00*

U.S. Cl. 343—786 **16 Claims**



1. A conical corrugated microwave feed horn comprising in combination:

a conical flare section, said flare section having a smooth conical region and a corrugated conical region, said feed horn having a cylindrical aperture formed on a first open end,

a cylindrical throat formed on a second open end opposing said cylindrical aperture,

a plurality of slots formed parallel to the central axis of said feed horn in said corrugated conical section, each slot of said plurality of slots having an inner surface with an outer end closest to the central axis of said feed horn and an outer surface furthest from the central axis, said plurality of slots having a first slot connected to said smooth conical region,

said smooth conical region connecting said cylindrical throat to said outer end of said first slot of said plurality of slots, said smooth conical region having a first predetermined angle from the central axis of said feed horn through said first slot connection, said smooth conical region providing an impedance match between said corrugated conical region and said cylindrical throat so as to increase the bandwidth of said feed horn,

each slot of said plurality of slots having the outer end of the inner surface formed on a conical shape having a second predetermined angle from the central axis through said first slot connection, said second predetermined angle being greater in value than said first predetermined angle.

5,486,840

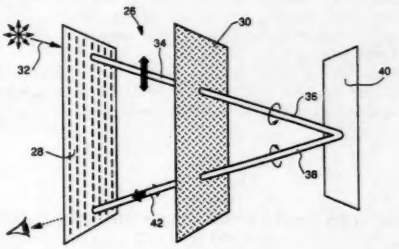
HEAD UP DISPLAY WITH INCIDENT LIGHT FILTER

Diego A. Borrego, Lafayette; Alan R. Greenland, Westfield, both of Ind.; Charles R. Allison, Flint, Mich.; Robert A. Bordo, Harrison Township, Mich., and Steven A. Stringfellow, Oakland, Mich., assignors to Delco Electronics Corporation, Kokomo, Ind.

Continuation of Ser. No. 210,855, Mar. 21, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 479,253

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—7 **3 Claims**



1. A head up display for reflecting information from a combiner wherein the angle of reflection effects light polarization, the display including optical filtering of extraneous reflections due to external incident light comprising:

a light emitting image source for generating display information, the image source comprising selectively energized segments subject to undesired illumination by external light incident on the combiner;

an optical system for projecting light from the image source onto the combiner at an incident angle near Brewster's angle to define a horizontal axis of polarization for light reflected from the combiner that originates from the image source; and

a circular polarizer between the optical system and the image source for suppressing external incident light reflected from the display surface, the circular polarizer comprising

a linear polarizer and quarter-wave plate in combination,

the linear polarizer and quarter-wave plate being disposed to circularly polarized external incident light reaching the image source and to absorb such polarized light after reflection from the image source, and

the linear polarizer having a polarization axis substantially parallel to the horizontal axis of polarization for horizontally polarizing light projected onto the combiner that originates from the image source to maximize the display efficiency.

5,486,841
GLASSES TYPE DISPLAY APPARATUS

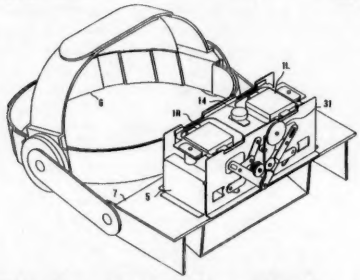
Nobuyuki Hara; Akira Kawamura, both of Kanagawa, and Takeshi Matsui, Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 15, 1993, Ser. No. 76,953

Claims priority, application Japan, Jun. 17, 1992, 4-158262; Jun. 22, 1992, 4-162969

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—8 **32 Claims**



1. A glassed type display apparatus for displaying an image including left and right virtual images generated by respective left and right display means and transmitted through respective left and right lens systems, said left and right lens systems each having a corresponding focal point and each being disposed symmetrically with respect a center point of a main point axis, said glasses type display apparatus comprising:

left and right slide means for moving respective left and right display means with respect to said left and right lens systems along corresponding left and right segment lines, each segment line extending through said center point of said main point axis and the focal point of a corresponding left or right lens system; and

a beam splitter located in front of eyes of a user, said beam splitter having a predetermined inclination with respect to optical axes of said left and right lens systems.

5,486,842
ON-SCREEN DISPLAY CIRCUIT OF THE INTERLACED SCANNING TYPE

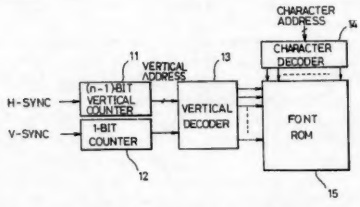
Ho H. Kim, Daeku, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-do, Rep. of Korea

Filed Jan. 5, 1995, Ser. No. 368,960

Claims priority, application Rep. of Korea, Jan. 7, 1994, 212/1994

Int. Cl.[6] G09G *1/16*

U.S. Cl. 345—26 **2 Claims**



1. An on-screen display circuit of the interlaced scanning type comprising:

a vertical counter for counting a horizontal synchronous signal inputted thereto and outputting the counted values as higher-order bits of a vertical address;

a 1-bit counter for counting a vertical synchronous signal inputted thereto by one bit and outputting the counted value as a least significant bit of the vertical address;

a vertical decoder for decoding output signals from said vertical counter and said 1-bit counter to designate a decoded vertical address;

a character decoder for decoding a character address inputted thereto to designate a decoded horizontal address; and

a font read only memory for outputting font data in its location corresponding to the-decoded vertical address from said vertical decoder and the decoded horizontal address from said character decoder.

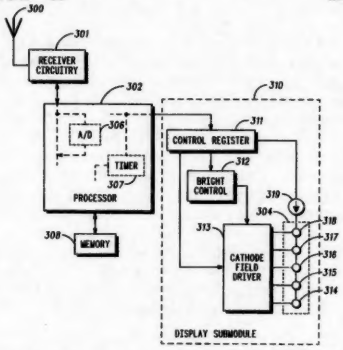
5,486,843
SIGNAL LEVEL INDICATOR AND ASSOCIATED METHOD

Marcia J. Otting, Mundelein, and John P. Kramer, Elk Grove Village, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 23, 1994, Ser. No. 264,656

Int. Cl.[6] G09G *3/04;3/14;* **G08C** *19/00*

U.S. Cl. 345—35 **15 Claims**



1. A portable electronic device having a signal level indicator for visually indicating the magnitude of at least one input signal, comprising:

a plurality of visual elements; and

a processor circuit operatively coupled to said plurality of visual elements for perceivably strobing said plurality of visual elements in response to the at least one input signal, said processor circuit determining a number of said plurality of visual elements to be individually illuminated during a display period said number of said plurality of visual elements based on the magnitude of the at least one input signal, and said processor circuit individually illuminating each one of said number of said plurality of visual elements for an individual illumination period during said display period such that no more than one of said number of said plurality of visual elements is illuminated at any one time.

5,486,844
METHOD AND APPARATUS FOR SUPERIMPOSING DISPLAYED IMAGES

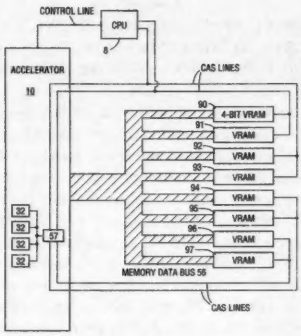
Martin Randall, Santa Cruz; Paul Campbell, Berkeley, and Douglas J. Gilbert, Livermore, all of Calif., assignors to Radius Inc, Sunnyvale, Calif.

Continuation of Ser. No. 876,758, May 1, 1992, abandoned. This application Feb. 1, 1994, Ser. No. 190,731

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—113 **2 Claims**

1. A system for performing a transparent data transfer operation



on a destination image comprised of destination pixels stored in a video memory, without reading any of the destination pixels from the video memory, including:

an internal memory for storing source pixels and background data, wherein the source pixels consist of foreground source pixels and background source pixels, and each of the source pixels corresponds with one of the destination pixels, and wherein the internal memory stores none of the destination pixels;

comparison and identification means for comparing the source pixels stored in the internal memory with the background data stored in the internal memory, and identifying each of said source pixels as a foreground source pixel or a background source pixel as a result of such comparison; and

means for writing only those source pixels identified as foreground source pixels to the video memory to substitute the source pixels identified as foreground source pixels for the destination pixels corresponding to said source pixels identified as foreground source pixels, wherein said means for writing includes means for generating a column address strobe signal for the video memory and selectively asserting said column address strobe signal to a first control line so as to disable transfers of the source pixels identified as background pixels to said video memory, thereby preventing said source pixels identified as background pixels from overwriting any of said destination pixels, wherein the comparison and identification means receives parallel streams of the source pixels and said comparison and identification means includes:

at least two banks of arithmetic logic units, each of said banks connected to receive a different one of the streams of the source pixels, said banks outputting parallel marked source pixel streams, each of the marked source pixel streams including source pixels of one of the streams of the source pixels, and marking data identifying each of the source pixels in said one of the streams of the source pixels as a foreground source pixel or a background source pixel, each of said banks including means for comparing each of the source pixels in said one of the streams with said background data, identifying said each of the source pixels in said one of the streams as a foreground source pixel or a background source pixel, and generating said marking data for said one of the streams;

at least one set of multiplexers, each of said multiplexers receiving source pixels from at least two of the marked source pixel streams and selectively combining said received source pixels into a multiplexed source pixel stream; and

a set of pipelined registers for receiving each said multiplexed source pixel stream from the multiplexers and asserting each said received multiplexed source pixel stream to a data bus coupled to the video memory.

5,486,845

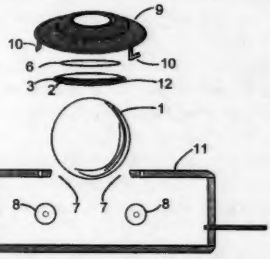
NON-LINTING BALL GASKET FOR COMPUTER MOUSE DEVICES AND METHOD

Abraham I. Chait, 730 Clearfield Dr., Millbrae, Calif. 94030

Continuation-in-part of Ser. No. 208,385, Mar. 10, 1994, abandoned. This application Nov. 3, 1994, Ser. No. 333,734

Int. Cl.[6] G09G *5/08*

U.S. Cl. 345—163 **12 Claims**



1. An improved cleaning gasket for use in a cursor positioning control device having movable ball control rollers mounted in engagement therewith, said gasket comprising:

a pad of material suitable for absorption of at least one of an oil and water;

a substantially lint-free netting secured to a side of said pad to be mounted in contract with the movable ball of said cursor positioning control device; and

said gasket further being formed and dimensioned to be mounted in a position in said control device substantially reducing the transmission of debris, lint, moisture and oil from the movable ball to the control rollers with said netting contacting said ball and said pad positioned to absorb materials wiped off of said ball by said netting.

5,486,846

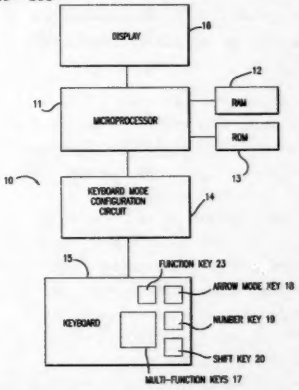
INTELLIGENT KEYPAD OVERLAY FOR PORTABLE PERSONAL COMPUTERS

Keith Comer, Mission Viejo; Gary Elsasser, Cerritos, both of Calif., and Takano Iwakiri, Tokyo, Japan, assignors to Toshiba America Information Systems, Inc., Irvine, Calif.

Continuation of Ser. No. 970,413, Nov. 2, 1992, abandoned. This application Aug. 9, 1994, Ser. No. 287,426

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—168 **15 Claims**



1. An apparatus for setting and indicating a current operational

mode of a keyboard having at least three modes of operation, the at least three modes of operation including a normal mode and a cursor mode and a number mode, the current operational mode being defined by an overlay flag and a numlock flag, the apparatus comprising:

at least two special actuation means, each for setting a mode of said keyboard, wherein one of said at least two special actuation means is a cursor mode actuator and wherein another of said at least two special actuation means is a number mode actuator; and

mode configuration means, responsive to actuation of one of said cursor mode actuator and said number mode actuator, for setting the operational mode of the keyboard to be one of the at least three modes of operation,

wherein said mode configuration means comprises cursor mode setting means for setting said overlay flag and for clearing said numlock flag when said cursor mode actuator is actuated, and

wherein said mode configuration means further comprises number mode setting means for setting said overlay flag and for setting said numlock flag when said number mode actuator is actuated.

5,486,847

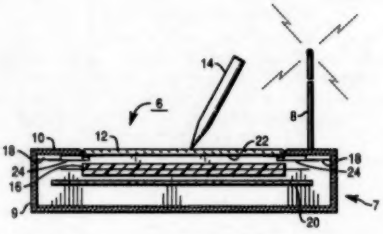
APPARATUS FOR A STYLUS INPUT SYSTEM FOR SHIELDING RFI/EMI FIELDS

Karl-Heinz Ranf, Friedberg, Germany, and Jack R. Penrod, Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 21, 1992, Ser. No. 994,973

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—173 **26 Claims**



1. A notepad computer, comprising:

a cabinet having an opening and defining a chamber, said cabinet having a first RFI/EMI shield positioned thereon;

a digitizer positioned within the chamber of said cabinet and producing an electromagnetic field;

a display device located over said digitizer;

a transparent plate located substantially within the opening of said cabinet and over said display device, said transparent plate having an outer side and an inner side, wherein the electromagnetic field produced by said digitizer is able to be altered by contacting the outer side of said transparent plate with an input stylus; and

a transparent second RFI/EMI shield located between said transparent plate and said digitizer.

5,486,848

RECORDING APPARATUS WHICH TWICE EJECTS DROPLETS TO THE SAME POSITION AND IMAGE FORMING APPARATUS WITH U-SHAPED MATERIAL PATH

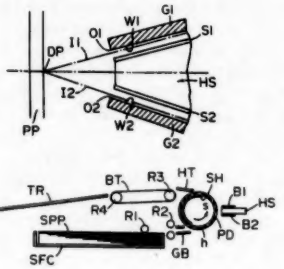
Naoki Ayata; Yoshiaki Shirato, both of Yokohama; Yasushi Takatori, Sagamihara, and Mitsuaki Seki, Machida, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 193,897, Feb. 9, 1994, abandoned, which is a continuation of Ser. No. 957,451, Oct. 7, 1992, abandoned, which is a continuation of Ser. No. 732,583, Jul. 18, 1991, abandoned, which is a division of Ser. No. 489,339, Mar. 6, 1990, abandoned, which is a division of Ser. No. 379,668, Jul. 13, 1989, abandoned, which is a continuation of Ser. No. 287,527, Dec. 19, 1988, abandoned, which is a continuation of Ser. No. 36,179, Apr. 8, 1987, abandoned, which is a continuation of Ser. No. 624,714, Jun. 26, 1984, abandoned, which is a division of Ser. No. 133,327, Mar. 24, 1980, Pat. No. 4,463,359. This application Mar. 23, 1995, Ser. No. 409,638

Claims priority, application Japan, Apr. 2, 1979, 54-39467; Apr. 2, 1979, 54-39468; Apr. 2, 1979, 54-39469; Apr. 2, 1979, 54-39470; Apr. 2, 1979, 54-39471; Apr. 2, 1979, 54-39472; Apr. 11, 1979, 54-43849; Feb. 22, 1980, 55-21348

Int. Cl.[6] B41J *2/05*

U.S. Cl. 347—15 **17 Claims**



1. An information recording apparatus comprising:

recording means for recording on a recording medium, said recording means having a plurality of heat energy generating elements corresponding to a plurality of ejection portions for ejecting ink, wherein each said heat energy generating element generates heat in response to a drive signal that causes a bubble to grow rapidly in the ink and then vanish gradually, so that the bubble forms more quickly than it vanishes, thereby ejecting ink droplets from corresponding ejection portions and attaching the ink droplets to the recording medium;

control means for causing said recording means to eject two ink droplets from different ejection portions to a same position on the recording medium so that the tone of the recording is emphasized; and

driving means for sequentially driving plural blocks of said heat energy generating elements, each said block including plural heat energy generating elements, by applying the drive signal to selected said heat energy generating elements in each said block in accordance with recording information.

5,486,849

THERMAL RECORDING DEVICE WITH HEAT EXCHANGE

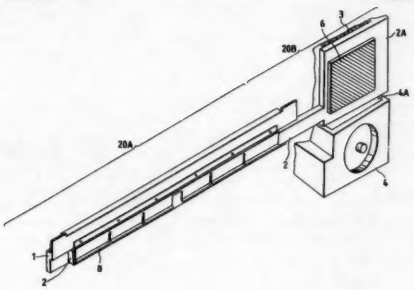
Yasushi Miura, Kawasaki; Haruhiko Moriguchi, Yokohama; Yasushi Murayama, Tokyo, and Hideyuki Tanaami, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1991, Ser. No. 681,068

Claims priority, application Japan, Apr. 6, 1990, 2-090101; Apr. 6, 1990, 2-090102; Apr. 6, 1990, 2-090103; Apr. 6, 1990, 2-090104; Apr. 6, 1990, 2-090105; Apr. 6, 1990, 2-090107; Apr. 6, 1990, 2-090108; Apr. 6, 1990, 2-090109

Int. Cl.[6] B41J *2/01;2/05;29/377*

U.S. Cl. 347—18 5 Claims



1. A recording apparatus for recording onto a recording medium having a recording width by using heat energy, while conveying said recording medium, comprising:

a recording head unit having a balance area;

a recording head having plural heating elements for generating said heat energy, said recording head being included in said recording head unit;

a first heat exchange member for exchanging heat with said recording head and which is joined with said recording head, and which is included in said recording head unit;

a heat exchange unit comprising a second heat exchange member for exchanging heat with an atmosphere and which is provided outside of an area where said recording head is disposed, said second heat exchange member being connected to said first heat exchange member at a connecting section for heat exchange therebetween, and which is included in said recording head unit, said heat exchange unit exchanging heat between said second heat exchange member and said atmosphere;

a support member for supporting at least a vicinity of said balance area of said recording head unit, said first heat exchange member including an end opposite the connecting section between said first and second heat exchange members; and

moving means connected to said support member to move said recording head unit between a recording position and a non-recording position,

wherein said support member supports at least a vicinity of the balance area of said recording head unit so that said recording unit is supported in a desired balance, thus reducing a load for said moving mea.ıs.

5,486,850

INK JET RECORDING APPARATUS FOR CLEANING THE RECORDING HEAD IN ACCORDANCE WITH THE RECORDING COLOR

Fumiharu Nakamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

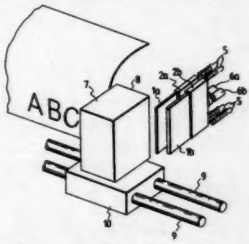
Continuation of Ser. No. 988,000, Dec. 9, 1992, abandoned, which is a continuation of Ser. No. 884,775, May 13, 1992, abandoned, which is a division of Ser. No. 514,732, Apr. 26, 1990, Pat. No. 5,126,765. This application Oct. 21, 1994, Ser. No. 328,343

Claims priority, application Japan, Apr. 26, 1989, 1-106575; Apr. 18, 1990, 2-102418

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—24 14 Claims

1. An ink jet recording apparatus comprising:



a carriage carrying a recording head and scanned in both a recording area and a non-recording area;

a cleaning member contacting a discharge port forming surface of said recording head for discharging an ink to clean the discharge port forming surface, said cleaning member comprising a plurality of cleaning blades, each said blade having an elasticity; and

recording mode setting means for setting a first recording mode in which a plurality of colors are used for recording and a second recording mode in which a single color is used which is different from the colors of the first recording mode,

wherein the discharge port forming surface is cleaned by said plurality of cleaning blades when the first recording mode is set and the discharge port forming surface is cleaned by a single said cleaning blade when the second recording mode is set.

5,486,851

ILLUMINATION DEVICE USING A PULSED LASER SOURCE A SCHLIEREN OPTICAL SYSTEM AND A MATRIX ADDRESSABLE SURFACE LIGHT MODULATOR FOR PRODUCING IMAGES WITH UNDIFRACTED LIGHT

Andreas Gehner; Günther Hess; Heinz Köck, all of Duisburg, and Holger Vogt, Mülheim, all of, Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V., Munich, Germany

PCT No. PCT/DE91/00859, § 371 Date Jul. 19, 1994, § 102(e) Date Jul. 19, 1994, PCT Pub. No. WO93/09469, PCT Pub. Date May 13, 1993

PCT Filed Oct. 30, 1991, Ser. No. 232,005

Int. Cl.[6] G03B *27/54*

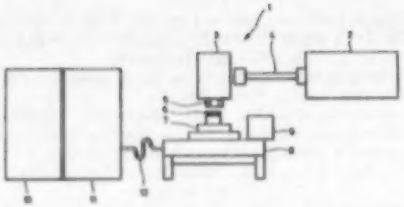
U.S. Cl. 347—258 13 Claims

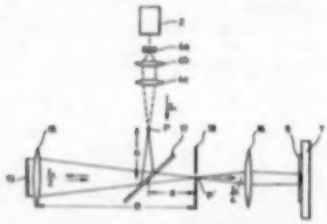
1. An illumination device for producing models used for manufacturing electronic elements, or for direct illumination of wafers or substrates during photolithographic steps for producing the electronic elements, or for direct illumination of structures including light-sensitive layers, comprising:

a pulsed laser light source;

a pattern generator;

an object onto which light emitted by said laser light source is focussed, said object being selected from the group consisting of a model, a disk, a substrate and a structure;





said pattern generator includes an optical Schlieren system and an active, matrix-addressable surface light modulator,

said surface light modulator has a reflective surface having addressed surface areas which diffract incident light and non-addressed surface areas which reflect incident light,

said Schlieren system comprises a Schlieren lens arranged on a side of said surface light modulator, a projection lens facing away from said surface light modulator, and a mirror device which is arranged between said Schlieren lens and said projection lens for directing light coming from said pulsed laser light source onto said reflective surface on said surface light modulator,

wherein said Schlieren lens is arranged from said surface light modulator a distance less than a focal length of said Schierlen lens,

focussing means for focussing the light coming from said light source in at least one point which is spaced apart from said mirror device and which is adapted to have associated therewith at least one virtual point light source by reflecting a point at said mirror device,

a filter device arranged in a diffraction image plane of the virtual point light source between said Schlieren lens and said projection lens, said filter device being designed to filter out diffracted light reflected by the addressed surface areas of said surface light modulator and permit undiffracted light reflected by said non-addressed surface areas to pass through said projection lens to the model, the disk, the substrate, or the structure, and to filter out undiffracted light reflected by said non-addressed surface areas of said surface light modulator, and permit said diffracted light reflected by said addressed surface areas to pass through said projection lens to the model, the disk, the substrate, or the structure, and

a displaceable positioning table capable of having the model, the disk, the substrate or the structure secured thereon in position so that a sharp image of said surface areas of said surface light modulator can be formed on the model, the disk, the substrate, or the structure,

wherein said pulsed laser light source is constructed such that a pulse duration of said pulsed laser light source is shorter than a minimum structural dimension of the model, the disk, the substrate or the structure divided by a displacement rate of said positioning table, and

wherein, during the displacement of said positioning table, the model, the disk, the substrate or structure are composed of a plurality of partial images by adequate addressing of said surface light modulator.

5,486,852

CAMERA-INTEGRATED VIDEO RECORDER SYSTEM HAVING MOUNTABLE AND DEMOUNTABLE REMOTE-CONTROL UNIT

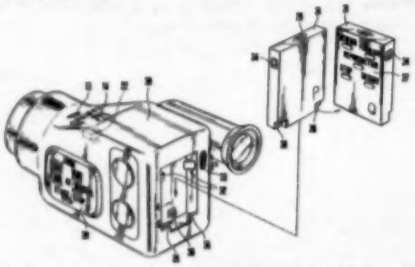
Takashi Arai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 699,205, May 13, 1991, abandoned. This application Jun. 29, 1993, Ser. No. 85,131

Claims priority, application Japan, May 22, 1990, 2-132892

Int. Cl.[6] H04N *5/225;5/232*

U.S. Cl. 348—211 **14 Claims**



1. A camera-integrated video recorder system having an operation switch for a camera shooting mode and an operation switch for a video recorder mode, comprising:

a) a system body;

b) a remote-control unit which is detachably mountable on said system body; and

c) change-over means for switching between a camera shooting mode and a video recorder mode in association with an operation of mounting and demounting said remote-control unit on or from said system body, wherein only said operation switch for the camera shooting mode is usable when said remote-control unit is mounted on said system.

5,486,853

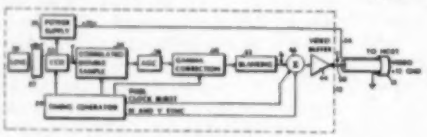
ELECTRICAL CABLE INTERFACE FOR ELECTRONIC CAMERA

Larry K. Baxter, Gloucester, and John J. Coffey, Northborough, both of Mass., assignors to PictureTel Corporation, Peabody, Mass.

Filed Dec. 13, 1994, Ser. No. 355,036

Int. Cl.[6] H04N *5/228*

U.S. Cl. 348—222 **33 Claims**



1. A video camera system comprising:

an electronic camera head comprising:

a solid-state video imager for providing a video signal waveform comprising analog video signals, and

timing generating circuitry for generating horizontal and vertical synchronizing signals and a pixel clock signal;

a host video processor, located externally from the electronic camera head for receiving the analog video signals from the solid-state video imager and the horizontal and vertical synchronizing signals and the pixel clock signal from the timing generating circuitry, comprising:

an analog to digital converter for converting the analog video signals to digital video signals, and

digital signal processing circuitry for processing the digital video signals; and

an electrical cable for carrying the video signal waveform from the electronic camera head and the horizontal and vertical synchronizing signals and the pixel clock signal to the host video processor.

5,486,854

INK JET RECORDING APPARATUS

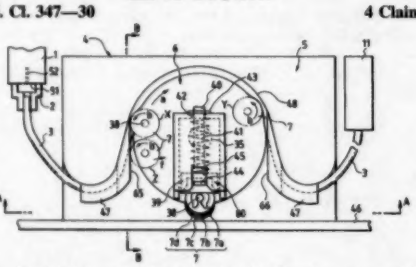
Haruo Uchida, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1992, Ser. No. 942,419

Claims priority, application Japan, Sep. 11, 1991, 3-259724; Jan. 16, 1992, 4-025728

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—30 **4 Claims**



1. An ink jet recording apparatus for forming a record by discharging ink from a recording means for recording onto a recording material, the recording means having a plurality of discharge openings, the apparatus comprising:

more than three tube pumps for effecting an ink discharge recovery by causing at least one of suction and pressurization of said discharge openings of said recording means, each said tube pumps having;

a tube for communicating with a corresponding said discharge opening; and

a pressure roller for deforming said tube by first pressing and releasing said tube at a predetermined timing; and

deforming control means for controlling a timing with which said tube of said tube pumps are deformed by pressing and releasing,

wherein the timing of the pressing of each said tube, or the timing of the releasing from pressing of each said tube, or the timing of both the pressing and the releasing from pressing of each said tube, is such that a time period of a pressure variation for recovery is substantially duplicated for each said tube, so that each said tube experiences a pressure change at approximately a same time, yet so that the pressure changes of each respective tube begin and end at slightly different times from one another.

5,486,855

APPARATUS FOR SUPPLYING INK TO AN INK JET PRINTER

Michael Carlotta, Sodus; Steven J. Dietl, Ontario, and Richard A. Morano, Lyons, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 634,585, Dec. 27, 1990, Pat. No. 5,233,369. This application Jan. 28, 1993, Ser. No. 10,045

Int. Cl.[6] B41J *2/175*

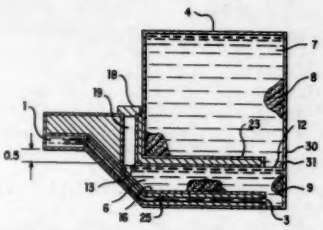
U.S. Cl. 347—87 **21 Claims**

1. An ink jet cartridge for an ink jet printer comprising:

a cartridge housing having a first chamber and a second chamber for containing ink at a negative pressure, said first chamber being disposed above said second chamber;

a printhead disposed at a vertical height greater than a top level of said second chamber;

a supply line for conveying ink to said printhead; and



means for conducting ink from said first chamber and said second chamber to said supply line, said means for conducting ink being maintained at a pressure lower than the negative pressure in each of said first chamber and said second chamber.

5,486,856

COLOR THERMAL PRINTER

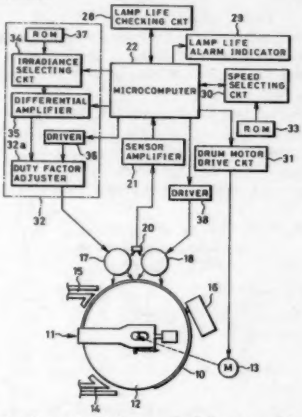
Nobuo Katsuma; Satoshi Ueda, and Hiroyuki Matsukawa, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1994, Ser. No. 277,624

Claims priority, application Japan, Jul. 22, 1993, 5-181480

Int. Cl.[6] B41J *2/32;* **B41M** *5/28;5/34*

U.S. Cl. 347—175 **29 Claims**



21. A color thermal printing method for use with color thermosensitive recording material including a support and first to third thermosensitive coloring layers formed thereon, said first to third coloring layers arranged toward said support from an obverse of said recording material, relative movement caused between said recording material and a thermal head relative to one another, said relative movement subjecting said first to third coloring layers to thermal recording sequentially in an order listed, and wherein a first ultraviolet lamp is actuated for optical fixation of said first coloring layer after said thermal recording, and a second ultraviolet lamp is actuated for optical fixation of said second coloring layer after said thermal recording, said color thermal printing method comprising steps of:

measuring, with a sensor, a first irradiance of said first lamp while actuated by a drive signal set at a duty factor;

measuring, with said sensor, a second irradiance of said second lamp while actuated;

determining a target irradiance in accordance with said first irradiance;

redetermining said duty factor of said drive signal in accordance with said first irradiance and said target irradiance, said drive

signal supplied to said first lamp, to actuate said first lamp at said target irradiance;

determining a first relative speed in accordance with heat sensitivity of said first coloring layer;

maintaining said first lamp at said target irradiance;

causing said relative movement of said recording material at said first speed, for said thermal recording to said first coloring layer through said thermal head, and for fixing said first coloring layer with said first lamp after said thermal recording;

determining a second relative speed in accordance with said first irradiance;

causing said relative movement of said recording material at said second speed, for supplementary fixation of said first coloring layer with said first lamp;

determining a third relative speed in accordance with heat sensitivity of said second coloring layer;

causing said relative movement of said recording material at said third speed, for said thermal recording to said second coloring layer through said thermal head, and for fixing said second coloring layer with said second lamp after said thermal recording;

determining a fourth relative speed in accordance with said second irradiance; and

causing said relative movement of said recording material at said fourth speed, for supplementary fixation of said second coloring layer with said second lamp.

5,486,857

THERMAL IMAGING SYSTEM

David P. H. Smith, Sawbridgeworth; Mark T. Leonard, and David W. Swan, both of Harlow, all of, United Kingdom, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

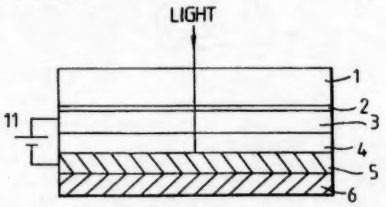
Continuation of Ser. No. 720,118, Jun. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 563,288, Aug. 6, 1990, Pat. No. 5,262,800. This application Jan. 13, 1993, Ser. No. 3,690

Claims priority, application United Kingdom, Aug. 15, 1989, 8918622

The portion of the term of this patent subsequent to Nov. 16, 2010, has been disclaimed.

Int. Cl.[6] B41J *2/435*

U.S. Cl. 347—224 **15 Claims**



1. A thermal imaging device having a print surface for providing localized heating to a layer comprising a thermally activatable component of an image forming system, the device comprising the following sequential layers:

(a) a transparent or semi-transparent electrically conductive layer,

(b) a photoconductive layer which when illuminated by radiation of 633 nm wavelength and intensity of 4.0×10^6 W/m^2 has a conductivity of at least 0.01 S/cm and a photosensitive ratio of at least 1×10^3, layer (b) being in contact with layer (a) and layer (c),

(c) an electrically conductive layer in electrical contact with the photoconductive layer (b) and in contact with:

(d) said layer comprising said thermally activatable component of said image forming system;

wherein the layers are constructed and arranged such that when a voltage potential is applied across layers (a) and (c) and the device is exposed through layer (a) to form exposed areas of layer (b), the exposed areas of layer (b) become conductive, enhancing current flow and generating heat in layer (b) at points corresponding to the exposed areas of layer (b) and causing localized heating at areas at the print surface adjacent exposed areas of layer (b) sufficient to thermally activate said thermally activatable component of said image forming system, the device not containing ferromagnetic garnet materials.

5,486,858

METHOD AND CIRCUIT FOR A NOISE-REDUCED PROCESSING OF PERIODICAL OPTICAL SIGNALS

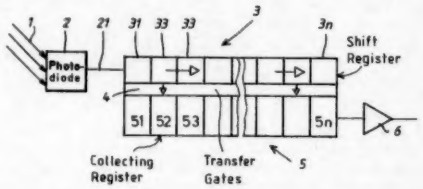
Klaus Knupfer, Essingen, Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Germany

Filed Oct. 19, 1992, Ser. No. 963,395

Claims priority, application Germany, Jan. 19, 1991, 41 34 666.1

Int. Cl.[6] H04N *5/335*

U.S. Cl. 348—303 **14 Claims**



1. A method for processing optical signals being periodical and having a first frequency, the method comprising the steps of:

converting the optical signals into electrical signals in a single photoelectric converter;

inputting the electrical signals into an analog shift register at a clock frequency which is an integer multiple of said first frequency greater than one;

after each lapse of a period of said first frequency, transmitting the content of said analog shift register in parallel to a collecting register;

repeating the above steps over a specific number of periods of said first frequency for accumulating a charge pattern in said collecting register;

after each lapse of said specific number of periods, emitting a sequential output to a downstream circuit; and,

said optical signals being sinusoidal and said clock frequency of said analog shift register and said collecting register being three to eight times said first frequency.

5,486,859

CHARGE-COUPLED DEVICE TYPE SOLID STATE IMAGING DEVICE MAKING BEST USE OF EFFECTIVE PIXELS AND OBTAINING IMAGES OF DIFFERENT TWO OR MORE KINDS OF ASPECT RATIOS

Fumiyoshi Matsuda, Souraku, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 3, 1993, Ser. No. 147,850

Claims priority, application Japan, Nov. 6, 1992, 4-296920; Jan. 12, 1993, 5-254131

Int. Cl.[6] H04N *5/335;5/225*

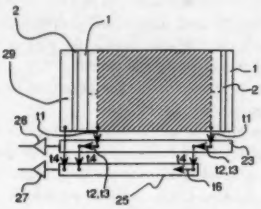
U.S. Cl. 348—311 **11 Claims**

1. A CCD type solid state imaging device, comprising:

a light receiving portion for receiving light and generating charges corresponding to the light;

a vertical CCD for transferring the charges from the light receiving portion in a vertical direction;

a first horizontal CCD for receiving the charges from the vertical CCD and transferring the charges in a horizontal direction;



a second horizontal CCD which is arranged in parallel to the first horizontal CCD and transfers the charges received from the first horizontal CCD in the same horizontal direction, said second horizontal CCD being shorter than the first horizontal CCD;

a coupling for transferring the charges, which are being transferred in the horizontal direction by the first horizontal CCD, to the second horizontal CCD at any arbitrary time point during horizontal transfer by the first horizontal CCD;

first output circuit connected to said first horizontal CCD and responding to an output of said first horizontal CCD to provide an image signal of a first aspect ratio; and

second output circuit connected to said second horizontal CCD and responding to an output of said second horizontal CCD to provide an image signal of a second aspect ratio narrower than said first aspect ratio.

5,486,860

VIDEO CAMERA WITH AUTOFOCUS FUNCTION AND METHOD OF CONTROLLING THE SAME

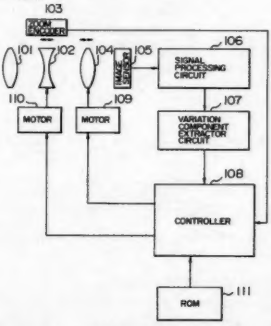
Junji Shiokawa; Hiroshi Chiba; Toshio Murakami; Yoshihiro Todaka; Ichiro Ohsaka, all of Yokohama, and Takashi Azumi, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 154,263, Nov. 18, 1993, abandoned. This application Apr. 6, 1995, Ser. No. 417,440

Claims priority, application Japan, Nov. 30, 1992, 4-320339

Int. Cl.[6] H04H *5/232*

U.S. Cl. 348—354 **19 Claims**



1. A video camera which performs autofocus by moving a focusing lens in accordance with information obtained from a video signal produced from an image sensor and changes the zooming magnification by moving a variator lens, comprising:

first drive means for moving said variator lens;

second drive means for moving said focusing lens including means for slightly vibrating said focusing lens on an optical axis;

detection means for detecting a direction and a degree of a shift of said focusing lens from an in-focus position on the basis of a phase and an amplitude of a variation component of the video signal produced from said image sensor;

memory means for storing a plurality of relations each defined between a position of said variator lens and a position of said focusing lens in respect of constant subject distances, one of said relations being used to form an image of an object located at a one of the constant subject distances; and

control means for controlling said second drive means in accordance with the detected direction and degree of the shift by controlling, when said variator lens is moved by said first drive means, said second drive means in compliance with movement of said variator lens pursuant to a one of said relations which is specified by positions assumed by said variator leans and focusing lens when the direction and the degree of the shift is indicated by the variation component to be less than a predetermined value, and adjusting the movement of the focusing lens by a predetermined correction amount when the direction and degree of the shift is indicated by the variation component to be greater than the predetermined value so that said movement of said variator lens is made pursuant to a second one of said plurality of specified relations.

5,486,861

ELECTRONIC CAMERA WITH DUAL EXPOSURE AND SELECTIVE RECORDING

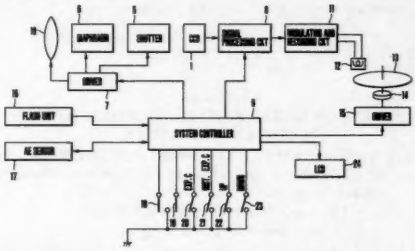
Ryosuke Miyamoto; Makoto Sekita, and Shohei Takeda, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 970,288, Nov. 2, 1992, abandoned, which is a division of Ser. No. 325,547, Mar. 20, 1989, Pat. No. 5,189,519. This application Oct. 20, 1994, Ser. No. 326,813

Claims priority, application Japan, Mar. 22, 1988, 63-065859; Jun. 7, 1988, 63-139620; Jun. 7, 1988, 63-139621; Jun. 16, 1988, 63-146908

Int. Cl.[6] H04N *5/235*

U.S. Cl. 348—362 **33 Claims**



1. An image sensing device comprising:

(a) image sensing means for converting an optical image into an electrical signal;

(b) light measuring means, arranged separately from said image sensing means, for detecting light coming from an object to be photographed to form first light measurement data;

(c) control means for controlling an exposure condition of said image sensing means, making a first exposure on said image sensing means in accordance with said first light measurement data, and reading out an output of said image sensing means formed by the first exposure to form second light measurement data;

said control means also being operable to make a second exposure on said image sensing means in accordance with said second light measurement data; and

(d) recording means operating with selection of one of a first mode in which the output of said image sensing means formed by the first exposure is read out and recorded and a second mode in which the output of said image sensing means formed by the second exposure is read out and recorded.

5,486,862

MOTION PICTURE ENCODING SYSTEM

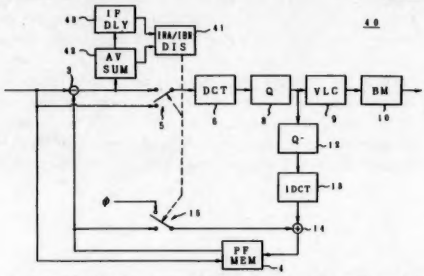
Yoichi Yagasaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 949,397, Sep. 22, 1992. This application May 2, 1995, Ser. No. 432,793

Claims priority, application Japan, Sep. 30, 1991, 3-278808

Int. Cl.[6] H04N *7/24*

U.S. Cl. 348—399 **1 Claim**



1. A motion picture encoding system for either intra-frame encoding or inter-frame encoding a motion picture which includes a sequence of frames, comprising:

a first encoding means for encoding at least a portion of the motion picture by intra-frame encoding;

a second encoding means for encoding at least a portion of the motion picture by inter-frame encoding;

means for obtaining inter-frame difference data for a current frame;

means for obtaining inter-frame difference data for a frame next to be encoded; and

means for selecting the first encoding means if the difference data for the next frame to be encoded is greater than a multiple of a predetermined integer (equal to or greater than one) times the difference data for the current frame, and otherwise selecting the second encoding means.

5,486,863

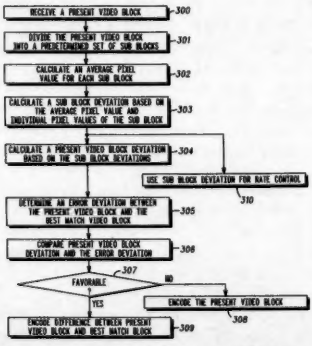
METHOD FOR DETERMINING WHETHER TO INTRA CODE A VIDEO BLOCK

Cheung Auyeung; Kevin J. O'Connell, both of Palatine, and Stephen N. Levine, Itasca, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1994, Ser. No. 235,611

Int. Cl.[6] H04N *7/50*

U.S. Cl. 348—420 **11 Claims**


RECEIVE A PRESENT VIDEO BLOCK
DIVIDE THE PRESENT VIDEO BLOCK INTO A PREDETERMINED SET OF SUB BLOCKS
CALCULATE AN AVERAGE PIXEL VALUE FOR EACH SUB BLOCK
CALCULATE A SUB BLOCK DEVIATION BASED ON THE AVERAGE PIXEL VALUE AND INDIVIDUAL PIXEL VALUES OF THE SUB BLOCK
CALCULATE A PRESENT VIDEO BLOCK DEVIATION BASED ON THE SUB BLOCK DEVIATIONS
USE SUB BLOCK DEVIATION FOR RATE CONTROL
DETERMINE AN ERROR DEVIATION BETWEEN THE PRESENT VIDEO BLOCK AND THE BEST MATCH VIDEO BLOCK
COMPARE PRESENT VIDEO BLOCK DEVIATION AND THE ERROR DEVIATION
FAVORABLE ?
NO
YES
ENCODE THE PRESENT VIDEO BLOCK
ENCODE DIFFERENCE BETWEEN PRESENT VIDEO BLOCK AND BEST MATCH BLOCK

1. In a video encoder, a method for determining, for an incoming video frame, whether a present video block of the incoming video frame will be encoded or whether a difference between the present video block and a best match video block of a previously stored video frame will be encoded, the method comprising the steps of:

a) for the present video block, dividing the present video block into a predetermined set of sub blocks;

b) for each sub block of the predetermined set of sub blocks, calculating an average pixel value;

c) for each sub block of the predetermined set of sub blocks, calculating a sub block deviation based on the average pixel value and individual pixel values of the sub block;

d) for the present video block, calculating a present video block deviation based on the sub block deviation for each of the sub blocks in the predetermined set of sub blocks;

e) determining an error deviation between the present video block and the best match video block;

f) when a comparison of the present video block deviation to the error deviation is unfavorable, encoding the present video block; and

g) when the comparison of the present video block deviation to the error deviation is favorable, encoding the difference between the present video block and the best match video block.

5,486,864

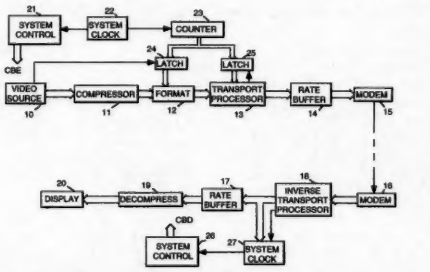
DIFFERENTIAL TIME CODE METHOD AND APPARATUS AS FOR A COMPRESSED VIDEO SIGNAL

Joel W. Zdepski, Belle Mead, N.J., assignor to RCA Thomson Licensing Corporation, Princeton, N.J.

Filed May 13, 1993, Ser. No. 60,924

Int. Cl.[6] H04N *7/13*

U.S. Cl. 348—423 **16 Claims**



1. Apparatus for providing a compressed video signal comprising:

a source of compressed video signal;

means for segmenting said compressed video signal and forming segments of said compressed video signal into video transport packets having transport headers and compressed video payloads;

means for generating time stamps;

means for forming auxiliary transport packets having auxiliary transport headers and payloads including said time stamps and a modifiable field for including further timing information related to incremental delays incurred by the auxiliary transport packet during subsequent transmission processing of said auxiliary transport packet; and

means for interspersing said video transport packets with said auxiliary transport packets to form a compressed video signal for transmission.

5,486,865

DATA DECODER ADAPTED TO DECODE DATA OF DIFFERENT RATES AND/OR ENCODED FORMATS

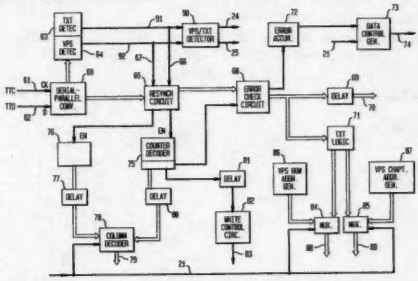
Shirley J. James, Southampton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 25, 1993, Ser. No. 36,771

Claims priority, application United Kingdom, Mar. 25, 1992, 9206495

Int. Cl.[6] H04N *7/08*

U.S. Cl. 348—465 **21 Claims**



1. A data decoder for decoding data occurring at a plurality of data rates and/or encoding formats and transmitted in one or more lines of a field blanking interval of a television signal, said data decoder comprising control means having a first state which causes the decoder to attempt to detect data transmitted at a first data rate and having a first encoding format and having one or more further states which cause the decoder to attempt to detect data transmitted at one or more different data rates and/or different encoding formats, and means for detecting invalid data, and wherein said control means is arranged to change state in response to the detection of invalid data.

5,486,866

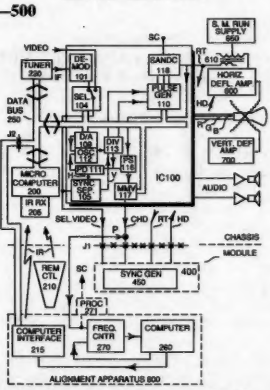
OSCILLATOR FREE RUN FREQUENCY SETTING BY DATA BUS CONTROL

Kenneth J. Helfrich; Joseph C. Stephens, both of Fishers; Kevin E. McClain, and Brian Lee, both of Indianapolis, all of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Jun. 21, 1994, Ser. No. 264,132

Int. Cl.[6] H04N *5/04*

U.S. Cl. 348—500 **20 Claims**



1. A free running frequency alignment method in a video display having a sync generator comprising a first oscillator having a first frequency and a second oscillator having a second frequency, where a free running frequency of said first oscillator is to be controllably aligned to a standard frequency, an output of said first oscillator being modulated by said second oscillator having a free running frequency different from said standard frequency, said alignment method comprising the steps of:

(a) applying to said first oscillator a frequency determining control signal having a first value;

(b) measuring, in accordance with modulation imposed by said second oscillator on said first oscillator output, said free running frequency of said first oscillator responsive to said control signal;

(c) determining a difference in frequency between the measured frequency and said standard frequency and generating said control signal having a new value responsive to said difference; and

(d) applying said control signal having said new value to said first oscillator for alignment with said standard frequency.

5,486,867

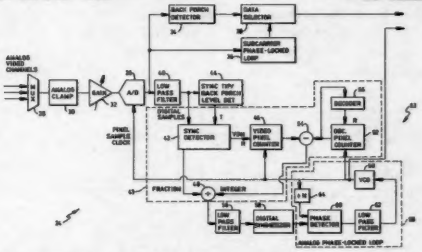
HIGH RESOLUTION DIGITAL PHASE DETECTOR

De D. Hsu, San Diego, Calif.; Frederick A. Williams, Bellevue, Wash., and Wendy L. Liu, San Diego, Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 30, 1993, Ser. No. 159,975

Int. Cl.[6] H04N *5/04*

U.S. Cl. 348—516 **26 Claims**



9. Apparatus comprising:

analog to digital converter means responsive to an analog video signal having periodic substantially linear synchronization regions for providing a sequence of digital samples at intervals in accordance with a pixel sample clock;

means for providing a threshold value corresponding to a predetermined level of said synchronization region of said analog video signal;

synchronization detector means responsive to said threshold value and the sequence of digital samples for providing a first control signal when a first one of said sequence of digital samples crosses said threshold value;

said synchronization detector means further comprising means for interpolating between S(i) and S(i−1) to provide a second control signal representative of when the threshold signal was crossed during the time interval between S(i) and S(i−1) where S(i) is said first one of said sequence of digital samples to cross said threshold value and S(i−1) is the immediately preceding digital sample before said threshold value was crossed; and

means responsive to said first and second control signals for adjusting said pixel sample clock to synchronize said pixel sample clock with said analog video signal and to cause said pixel sample clock to have a subpixel phase wherein a subsequent crossing of said threshold value occurs at a predetermined position in the time interval between two consecutive digital samples where one of the two consecutive digital samples occurs before and the other after the subsequent crossing.

20. A method of digitizing an analog video signal having periodic substantially linear synchronization regions, comprising the steps of:

converting the analog video signal to a sequence of digital samples at intervals in accordance with a pixel sample clock;

providing a threshold value corresponding to a predetermined level of said synchronization region of said analog video signal;

providing a first control signal when a first one of said sequence of digital samples crosses said threshold value;

providing a second control signal in accordance with the threshold value relative to values of S(i) and S(i−1) where S(i) is said first one of said sequence of digital samples to cross said threshold value and S(i−1) is the immediately preceding digital sample before said threshold value was crossed;

adjusting in response to the first signal the phase and frequency of said pixel sample clock into coincidence with said analog video signal; and

adjusting in response to the second control signal the subpixel phase of said pixel sample clock to provide a predetermined relationship between said threshold value and subsequent values of consecutive digital samples immediately before and immediately after crossing said threshold value.

5,486,868

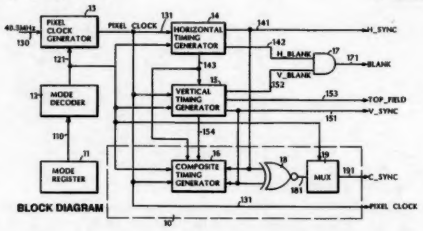
GENERATOR FOR SCAN TIMING OF MULTIPLE INDUSTRIAL STANDARDS

Rong-Fuh Shyu, and Wen-I Chu, both of Hsinchu, Taiwan, Prov. of China, assignors to Winbond Electronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed May 19, 1995, Ser. No. 445,336

Int. Cl.[6] H04N *5/06;5/04*

U.S. Cl. 348—524 **9 Claims**



1. A video scan timing generator, the video scan timing generator inputting a single timing clock, comprising:

a programmable mode register for storing and outputing a mode value which corresponds to a predetermined mode operation;

a mode decoder, adapted to receive the mode value, for outputing a mode control signal;

a first timing generator, adapted to receive the mode control signal and the single timing clock, for generating a pixel clock corresponding to the predetermined mode operation;

a second timing generator, adapted to receive the pixel clock and the mode control signal, for generating a horizontal synchronization signal and a horizontal blanking signal corresponding to the predetermined mode operation, the second timing generator including a first counter outputing a pixel_count value;

a third timing generator, adapted to receive the pixel clock, the pixel_count value and the mode control signal, for generating a vertical synchronization signal, a vertical blanking signal and a top_field signal corresponding to the predetermined mode operation, the third timing generator including a second counter outputing a horizontal_count value;

a fourth timing generator, adapted to receive the pixel clock, the pixel_count value, the horizontal_count value, the horizontal synchronization signal, the vertical synchronization signal and the mode control signal, for selectively generating an interlace composite synchronization signal;

AND gate, adapted to receive the horizontal and the vertical blanking signal, for generating a composite blanking signal;

EXCLUSIVE NOR gate, adapted to perform EXCLUSIVE NOR operation to the horizontal synchronization signal and the vertical synchronization signal, for generating a non-interlaced composite synchronization signal;

a selector, in response to the mode control signal, for selectively outputing the non-interlace composite synchronization signal and the interlace composite synchronization signal.

5,486,869

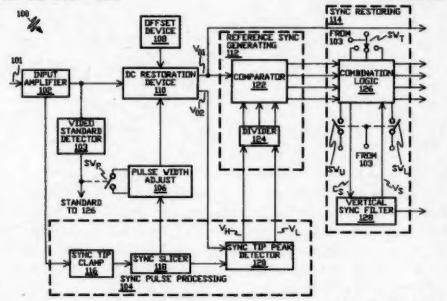
SYNCHRONIZING SIGNAL SEPARATING APPARATUS AND METHOD

J. Carl Cooper, Twin Parks Bldg., 718 University Ave., Suite 210, Los Gatos, Calif. 95030

Continuation of Ser. No. 837,323, Feb. 18, 1992, abandoned. This application Dec. 13, 1993, Ser. No. 165,688

Int. Cl.[6] H04N *5/08*

U.S. Cl. 348—525 **41 Claims**



1. A video signal processing apparatus for use with the synchronizing pulses thereof, said synchronizing pulses having at least a leading edge and a trailing edge including in combination:

at least one sampling circuit for sampling said synchronizing pulses in response to a plurality of sampling signals to generate at least a first reference signal and a second reference signal, said reference signals respectively representing different levels of said synchronizing pulses, wherein said sampling circuit includes DC restoring for restoring said synchronizing pulses to a predetermined DC reference level which said DC restored synchronizing pulses are coupled to at least one comparing circuit for comparing said video signal with a level responding to said reference signals thereby providing at least a precision sliced pulse signal, with said sampling being independent of said precision sliced pulse signal.

5,486,870

APPARATUS FOR THE DISPLAY OF PICTURES HAVING AN ASPECT RATIO 4/3 ON A DISPLAY HAVING AN ASPECT RATIO OF 16/9

Alain Decreamer, Garches, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1992, Ser. No. 958,895

Claims priority, application France, Jan. 16, 1991, 91 12765; Jan. 30, 1991, 91 13402

Int. Cl.[6] H04N *5/46*

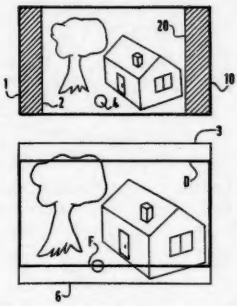
U.S. Cl. 348—556 **2 Claims**

1. A picture display apparatus for displaying an input video picture, the apparatus comprising:

a video display means having a first aspect ratio R_1, where aspect ratio is the ratio of width to height; and

displaying means coupled to said video display means, said displaying means including:

horizontal and vertical scanning circuits for displaying an input video picture in whole or in part as a displayed video picture on the video display means, the displayed video picture having a plurality of lines, each having a line length L, and being mutually separated from one another vertically by a vertical spacing W, wherein L has a value L_0 and W has a value W_0 when the input video picture has the first aspect ratio R_1, and is normally displayed on the video display means;



horizontal scanning control means of a continuously variable type coupled to said horizontal scanning circuit and operating directly on said horizontal scanning circuit; and

vertical scanning control means of a continuously variable type coupled to said vertical scanning circuit and operating directly on said vertical scanning circuit, wherein said horizontal scanning control means and said vertical scanning control means are coupled, and said horizontal and vertical scanning control means at least enable a user, at least in the situation that the input video picture has a second aspect ratio R_2, which is smaller than the first aspect ratio R_1, to continuously select said line length L and said vertical spacing W, while maintaining a relation between the line length L and the vertical spacing W in such a way that:

$$\frac{L/W}{L_0/W_0} = \frac{R_2}{R_1},$$

the value of L remaining L_0R_2/R_1 and L_0.

5,486,871

AUTOMATIC LETTERBOX DETECTION

Paul D. Filliman, Indianapolis; Nathaniel H. Ersoz, Brownsburg; Timothy W. Saeger, Indianapolis; David J. Duffield, Indianapolis, and Karl F. Horlander, Indianapolis, all of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

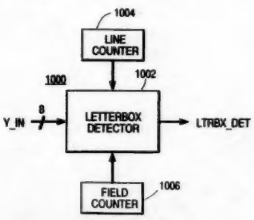
PCT No. PCT/US91/03739, § 371 Date Nov. 3, 1992, § 102(e) Date Nov. 3, 1992, PCT Pub. No. WO91/19390, PCT Pub. Date Dec. 12, 1991

PCT Filed May 29, 1991, Ser. No. 940,877

Claims priority, application United Kingdom, Jun. 1, 1990, 9012326

Int. Cl.[6] H04N *5/68;7/01*

U.S. Cl. 348—558 **14 Claims**



1. A video control system, comprising:

a deflection system having a vertically adjustable picture display characteristic;

means responsive to video luminance levels of a video signal during active scanning for detecting a letterbox video source signal; and,

means for controlling said adjustable picture display characteristic responsive to said detecting means.

5,486,872

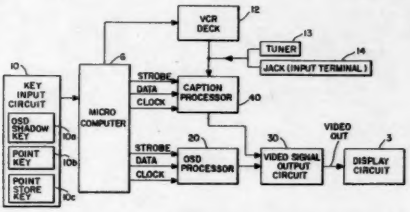
METHOD AND APPARATUS FOR COVERING AND REVEALING THE DISPLAY OF CAPTIONS

Si Young Moon, Inchon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Continuation-in-part of Ser. No. 23,676, Feb. 26, 1993, abandoned. This application Jun. 30, 1994, Ser. No. 269,094

Int. Cl.[6] H04N *5/262;5/278;5/445*

U.S. Cl. 348—564 **6 Claims**



1. In a method of displaying a caption in a video reproducing apparatus comprising a key input circuit containing a plurality of keys including an OSD shadow key and point key, which is selected by a user, a microcomputer coupled to said key input circuit for controlling the apparatus in response to a selected key input, an OSD processor coupled to said microcomputer for processing OSD characters in accordance with a first output of said microcomputer, a caption processor coupled to said microcomputer for generating a caption in accordance with a second output of said microcomputer, a video signal output circuit coupled to said OSD processor and to said caption processor for generating a composite video signal including the OSD characters, an optional caption, and a video signal, and a display for displaying an image corresponding to the composite video signal, said method comprising:

an initial routine comprising the steps of placing the apparatus in an OSD shadow mode by selecting the OSD shadow key of the key input circuit, determining whether a translated caption is displayed horizontally or vertically on the display, and setting a pointer at an initial position corresponding to whether the translated caption is displayed horizontally or vertically; and

an OSD character output routine comprising the steps of selecting a start position and an end position using a point key, and displaying OSD characters between the selected start position and end position so as to cover the translated caption.

5,486,873

SCREEN-ART CIRCUIT ADOPTING AN ANALOG METHOD

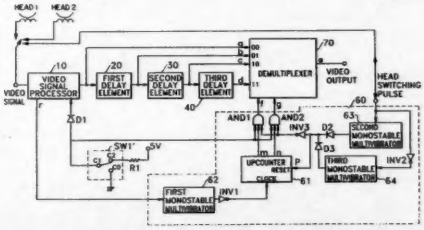
Hong-gyu Han, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Oct. 13, 1993, Ser. No. 135,487

Claims priority, application Rep. of Korea, Jan. 13, 1992, 92-18789

Int. Cl.[6] H04N *5/262*

U.S. Cl. 348—578 **7 Claims**



1. A screen-art circuit having an analog mode of operation for a video signal processing device including a video signal processor

having a color killer circuit for eliminating a color signal from an applied video signal received via a plurality of heads, said screen-art circuit comprising:

an art mode selector for selecting one of an operating mode and a non-operating mode of said screen-art circuit;

a plurality of delay devices, each of said delay devices delaying an output video signal generated from said video signal processor by one horizontal scanning period (1H);

a switch for selectively switching the output video signal generated from said video signal processor and said delay devices at 1H intervals, when an art mode is selected by said art mode selector, to produce screen art representing the output video signal; and

control signal generator for generating a control signal by logical combination of a switching signal for switching the heads and a composite sync signal generated from said video signal processor so as to control said switch.

5,486,874

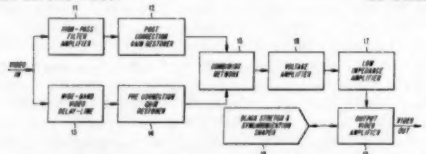
METHOD AND APPARATUS FOR IMPROVING TRANSMITTED VIDEO SIGNAL STRUCTURE

Jimmie D. Songer, Burleson, Tex., assignor to Magma, Inc., Fort Worth, Tex.

Filed May 13, 1994, Ser. No. 242,170

Int. Cl.[6] H04N *5/14*

U.S. Cl. 348—600 **21 Claims**



1. A video processor, having an input and an output, for compensating accumulated phase and amplitude errors encountered during transmission over a communications channel, of a video signal coupled to said input, comprising:

a high-pass filter, coupled to said input, having a bandwidth characteristic inverse to a low-pass characteristic encountered during transmission of a video signal over the communications channel;

an inverting amplifier, coupled to said high-pass filter, for inverting a high-pass-filtered video signal;

a post-correction-phase-and-gain restorer, coupled to said high-pass filter and to said inverting amplifier, for restoring a signal level of the high-pass-filtered video signal, as a restored-inverted-video signal;

a wide-band-video-delay line, coupled to said input, for delaying the video signal by an odd integer multiple of a half cycle at a subcarrier frequency as a delayed-video-signal;

a pre-correction-gain restorer, coupled to said wide-band-video-delay line, for restoring the delayed-video signal as a restored-delayed-video signal; and

a combining network, coupled to said output, to said post-correction-phase-and-gain restorer, and to said pre-correction-gain restorer, for combining the restored-inverted-video signal and the restored-delayed-video signal, and outputting a composite-video signal at said output.

9. A video processor, having an input and an output, for compensating accumulated phase and amplitude errors encountered during transmission over a communications channel, of a video signal, comprising:

high-pass-filter-and-amplifier means, coupled to said input, having a bandwidth characteristic inverse to a low-pass characteristic encountered during transmission of the video signal over the communications channel, for filtering the video signal as a filtered-video signal and for inverting the filtered-video signal as an inverted-filtered-video signal;

post-restorer means for restoring the inverted-filtered-video signal to a restored-signal level, thereby generating a restored-inverted-filtered-video signal;

delay means, coupled to said input, for delaying the video signal as a delayed-video signal; and

combining means for combining the restored-inverted-filtered-video signal and the delayed-video signal to generate a composite-video signal at said output.

5,486,875

IMAGE SIGNAL PROCESSING DEVICE

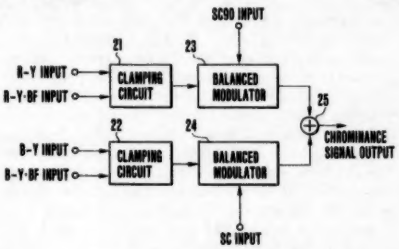
Katsuhito Sakurai, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1992, Ser. No. 904,188

Claims priority, application Japan, Jul. 2, 1991, 3-161518

Int. Cl.[6] H04N *9/65*

U.S. Cl. 348—642 **8 Claims**



1. An image signal processing device for processing an image signal, comprising:

(A) a first differential amplifier for receiving a color-difference signal and a reference signal;

(B) a second differential amplifier for receiving a burst flag signal and the reference signal; and

(C) a modulator for receiving together signals outputted from said first and second differential amplifiers and modulating the received signals by using a carrier signal.

5,486,876

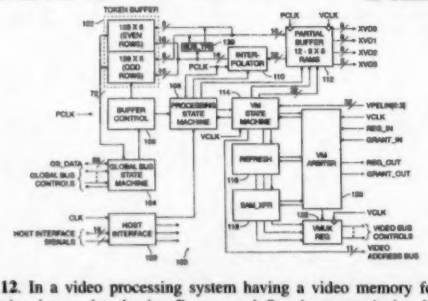
VIDEO INTERFACE UNIT FOR MAPPING PHYSICAL IMAGE DATA TO LOGICAL TILES

Stephen D. Lew; Gerry C. Luikuo, and Thomas G. Kopet, all of Colorado Springs, Colo., assignors to Array Microsystems, Inc., Colorado Springs, Colo., and Samsung Electronics Co. Ltd., Seoul, Rep. of Korea

Filed Apr. 27, 1993, Ser. No. 54,684

Int. Cl.[6] H04N *5/907*

U.S. Cl. 348—719 **25 Claims**



12. In a video processing system having a video memory for storing image data having P rows and Q columns, a device for reading and writing data to the video memory comprising:

means, coupled to a video bus, for mapping a physical image data having P rows and Q columns logically subdivided into a plurality of tiles having dimensions of p rows and q columns, to a storage memory, by placing the image data located on an

even numbered row of said p rows and an even numbered column of said q columns in a first buffer memory; and

means, coupled to said video bus, for mapping said given one of said tiles to said storage memory by placing the image data located at an odd numbered row of said p rows and at an odd numbered column of said q columns in to a second buffer memory.

23. In a video processing system having a video memory for storing image data having P rows and Q columns, a device for reading and writing data to the video memory comprising:

means, coupled to a video bus, for mapping a physical image data having P rows and Q columns logically subdivided into a plurality of tiles having dimensions of p rows and q columns, to a storage memory, a given one of said tiles, by placing the image data located on an even numbered row of said p rows and an even numbered column of said q columns in a first buffer memory and

for mapping said given one of said tiles to said storage memory by placing the image data located at an odd numbered row of said p rows and at an odd numbered columns of said q columns into a second buffer memory;

a circular buffer, coupled to said first and to said second buffer memory for storing a first set of data from said first buffer together with a second set of data from said second buffer as an array of image data having alternating odd and even rows;

an interpolator, coupled to said circular buffer for interpolating the array of image data;

an arbiter, coupled to the video bus, for controlling access to the video bus; and

a state machine, coupled to the means for mapping, to said interpolator and to said arbiter for sequencing operation of said means for mapping, said interpolator, and said arbiter.

25. A latch device for a DRAM memory interface comprising:

a latching signal pin on the DRAM memory interface coupled to a CAS signal output from the DRAM memory interface CAS pin to the DRAM memory;

a latch having:

an input coupled to an output of the DRAM memory;

an output coupled to said interface;

a latching signal input coupled to said latching signal pin; and

wherein when said latching signal pin is disabled, said latch is transparent.

5,486,877

AUDIO VISUAL SYSTEM WITH AUTOMATIC CLOSING OF A BUS CIRCUIT WHEN AN AV UNIT IS DISCONNECTED

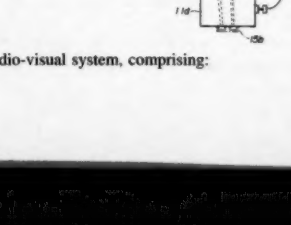
Shigeo Tanaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 4, 1994, Ser. No. 317,870

Claims priority, application Japan, Jan. 8, 1993, 5-252679

Int. Cl.[6] H04N *5/222*

U.S. Cl. 348—722 **9 Claims**



1. An audio-visual system, comprising:

an audio-visual system control component including at least one control connector, said control connector including an input terminal group and an output terminal group;

an AV bus cable;

switching means provided between said input terminal group and said output terminal group and operable so as to close an audio-visual bus circuit of said audio-visual system in response to detachment of a plug of said AV bus cable from said control connector and to open said audio-visual bus circuit of said audio-visual system in response to attachment of the plug of said AV bus cable to said control connector;

said AV bus cable including input side and output side plugs interconnected via a bus line, each of said input side plugs being receivable by said control connector and a corresponding one of said input side plugs being receivable by an image source connector provided on an image source component of said audio-visual system to be connected to said control component.

5,486,878

COLOR IMAGE DISPLAY APPARATUS WITH REFLECTION MIRRORS SIMULTANEOUSLY OSCILLATED

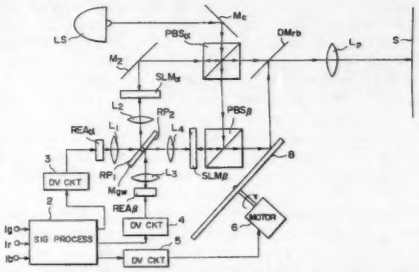
Ichiro Negishi; Tetsuji Suzuki, both of Yokosuka; Fujiko Koyama, Yokohama; Yuji Uchiyama, Yokosuka; Hiroyuki Bonde, Yokohama; Toshio Konno, Tokyo; Ryusaku Takahashi, and Toshiaki Shou, both of Yokosuka, all of, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 23, 1994, Ser. No. 313,585

Claims priority, application Japan, Sep. 24, 1993, 5-261654; Sep. 30, 1993, 5-268387; Jan. 8, 1993, 5-277697

Int. Cl.[6] H04N *9/31*

U.S. Cl. 348—757 **18 Claims**



1. A color image display apparatus, comprising:

light deflecting means having a first and a second oscillating reflection mirror attached to a common oscillating shaft a predetermined distance away from each other for deflecting a first light beam and a second light beam simultaneously by oscillating the first and second oscillating reflection mirrors at a predetermined period;

first light emitting means for emitting the first light beam intensity-modulated on the basis of an image signal of a specific primary color of three primary colors of additive color mixture for constituting a color image to be displayed, to the first oscillating reflection mirror of said light deflecting means;

second light emitting means for emitting the second light beam intensity-modulated on the basis of an image signal of two remaining primary colors, to the second oscillating reflection mirror of said light deflecting means, the two remaining primary colors being complementary to the specific primary color and the two remaining primary color light beams being separatable in space or time;

first focusing means for focusing the light beam deflected by the first oscillating reflection mirror to a first light-written type spacial light modulation element composed of at least a photo-conductive layer member and a light modulation sub-

stance layer member, to write the light beam deflected by the first oscillating reflection mirror;

second focusing means for focusing the light beam deflected by the second oscillating reflection mirror to a second light-written type spacial light modulation element composed of at least a photo-conductive layer member and a light modulation substance layer member, to write the light beam deflected by the second oscillating reflection mirror;

light resolving means for resolving light emitted by a read light source to three read lights of predetermined wave length bands corresponding to the three primary colors of the additive color mixture, respectively;

first light introducing means for introducing a resolved read light with a wave length band of the specific primary color, to said first light-written type spacial light modulation element as a read light;

second light introducing means for selectively introducing two remaining read lights with two wave length bands of the two primary colors complementary to the specific primary color, to said second light-written type spacial light modulation element as two read lights, separately in correspondence to light writing portions at which the second light beam intensity-modulated on the basis of the image signal of the two remaining primary colors has been written;

light synthesizing means for synthesizing two read lights intensity-modulated on the basis of the respective color image information and read from said first and second light-written type spacial light modulation elements separately, into light intensity-modulated on the basis of the respective image information; and

projecting means for projecting the light synthesized by said light synthesizing means onto a screen.

2. A color image display apparatus, comprising:

light deflecting means having a first and a second oscillating reflection mirror formed with a first reflective surface and a second reflective surface on both right and reverse sides thereof, the first and second mirrors being attached to a common oscillating shaft a predetermined distance away from each other for deflecting a first, a second, and a third light beams simultaneously by oscillating the first oscillating reflection mirror and the second oscillating reflection mirror;

first light emitting means for emitting the first light beam intensity-modulated on the basis of an image signal of a specific primary color of three primary colors of additive color mixture for constituting a color image to be displayed, to the first oscillating reflection mirror of said light deflecting means;

second light emitting means for emitting the second light beam intensity-modulated on the basis of an image signal of one of two remaining primary colors, to the first reflective surface of the second oscillating reflection mirror of said light deflecting means;

third light emitting means for emitting the third light beam intensity-modulated on the basis of an image signal of the other of two remaining primary colors, to the second reflective surface of the second oscillating reflection mirror of said light deflecting means;

first focusing means for focusing the light beam deflected by the first oscillating reflection mirror to a first light-written type spacial light modulation element composed of at least a photo-conductive layer member and a light modulation substance layer member;

second focusing means for focusing the light beam deflected by the first reflective surface of the second oscillating reflection mirror to a second light-written type spacial light modulation element composed of at least a photo-conductive layer member and a light modulation substance layer member;

third focusing means for focusing the light beam deflected by the second reflective surface of the second oscillating reflection mirror to a third light-written type spacial light modulation element composed of at least a photo-conductive layer member and a light modulation substance layer member;

light resolving means for resolving light emitted by a read light source to three read lights with wave length bands of the three primary colors of the additive color mixture, respectively;

light introducing means for introducing each of the three resolved read lights with three wave length bands of the three primary colors, to said first, second and third light-written type spacial light modulation elements, as a read light, respectively;

light synthesizing means for synthesizing three lights intensity-modulated on the basis of the respective color image signals and read from said first, second and third light-written type spacial light modulation elements separately, into light intensity-modulated on the basis of the respective image information; and projecting means for projecting the light synthesized by said light synthesizing means onto a screen.

3. A color image display means, comprising:

a first light-written type reflective spacial light modulation element composed of at least a photo-conductive layer member and a light modulating substance member, for writing two-dimensional image information of a first light beam intensity-modulated on the basis of an image signal of a specific primary color of three primary colors of additive color mixture for constituting a color image to be displayed;

a second light-written type reflective spacial light modulation element composed of at least a photo-conductive layer member and a light modulating substance member, for writing two-dimensional image information of a second light beam intensity-modulated on the basis of an image signal of two remaining primary colors, the two remaining primary colors being complementary to the specific primary color and the two remaining primary color light beams being separatable in space or time;

a first polarizing light beam splitter arranged on a read light incoming side of said first light-written type reflective spacial light modulation element;

a second polarizing light beam splitter arranged on a read light incoming side of said second light-written type reflective spacial light modulation element;

separating means for separating read light emitted by a read light source to a first read light of the specific primary color of three colors of additive color mixture and second read lights of two remaining primary colors complementary to the specific primary color;

light introducing means for introducing the separated first read light to the read light incoming side of said first light-written type reflective spacial light modulation element through said first polarizing light beam splitter;

selective light introducing means for selectively introducing the separated second read lights with two wave length bands of the two primary colors complementary to the specific primary color, to the read light incoming side of said second light-written type reflective spacial light modulation element through said second polarized light beam splitter, in correspondence to light writing portions at which the second light beams intensity-modulated on the basis of the image signal of the two remaining primary colors has been written;

synthesizing means for synthesizing the first read light having image information of the specific primary color of the three primary colors of additive color mixture, reflected by said first light-written type reflective light modulation element and outputted through said first polarizing light beam splitter; and the second read light having image information of the two remaining primary colors complementary to the specific primary color and separatable in space or time, reflected by said second light-written type reflective light modulation element, and outputted through said second polarizing light beam splitter, into light intensity-modulated on the basis of the respective image information; and

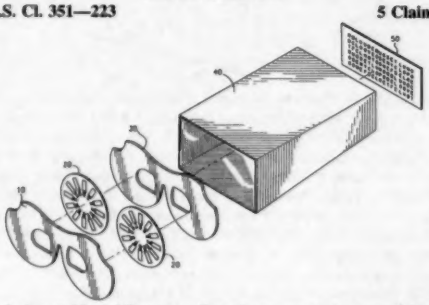
projecting means for projecting the light synthesized by said light synthesizing means onto a screen.

5,486,879

PORTABLE, PUBLIC USE READING GLASSES EYE TESTER

Mark Barnett, 2260 El Cajon Blvd. #119, San Diego, Calif. 92104

Filed Jun. 6, 1994, Ser. No. 254,567
Int. Cl.[6] A61B 3/02
U.S. Cl. 351—223 5 Claims



1. A portable public use reading glasses eye tester comprising:

a. a front section comprising 2 view plates with openings for two eyes and an indentation for a nose sandwiching two series of non prescription reading glass magnification lenses of increasing power, one series for each eye, and means for a user to adjust the lenses independently for each eye, and

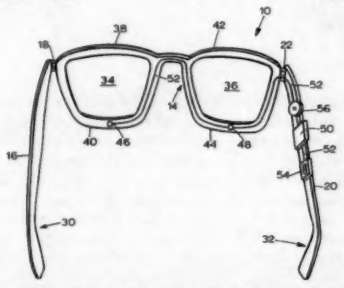
b. a rear section view tunnel with 2 open ends, a first open end attached to said front section and at a second open end a series of characters of predetermined size mounted on an end plate of light permeable rigid material at a predetermined distance from the lenses of the front section.

5,486,880

APPARATUS FOR CAUSING PUPIL CONSTRICTION

Paul M. House, 20 Boat La., Oswego, Ill. 60543

Filed Jun. 1, 1994, Ser. No. 252,369
Int. Cl.[6] G02C 1/00
U.S. Cl. 351—158 35 Claims



1. An apparatus for causing constriction of the pupil of an eye of a person having a deformity in the cornea of said eye so that light is not refracted through said deformity, impairing the vision of the person, said apparatus comprising:

light-generating means for generating light of an intensity sufficient to cause constriction of said pupil of the person to a degree sufficient to prevent light from being refracted through said deformity and thus to prevent impairment of the vision of the person; and

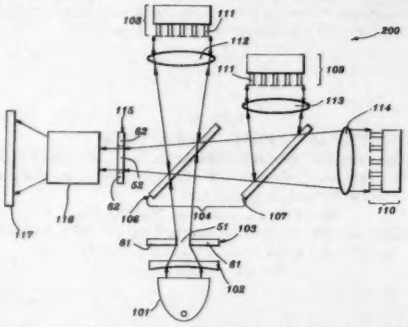
support means for supporting said light-generating means in a fixed position with respect to said eye of the person so that said light generated by said light-generating means is directed towards said pupil of the person and causes constriction of said pupil without substantially obstructing the vision of the person.

5,486,881

UNIQUE OPTICAL PROJECTION SYSTEM

Jin Hwang, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 9, 1995, Ser. No. 401,324
Claims priority, application Rep. of Korea, Mar. 9, 1994, 944521
Int. Cl.[6] G03B 21/28
U.S. Cl. 353—34 4 Claims



1. An optical projection system capable of displaying an M×N number of pixels, wherein M and N are integers, comprising:

a non-point white light source for emitting a white light along a first optical path on a first optical plane, wherein the white light consists of a first, second and a third primary light beams, each of the primary light beams being one of the primary colors;

a trinity of arrays of M×N actuated mirrors, including a first, a second and a third array of M×N actuated mirrors, each of the actuated mirrors having an actuator and a mirror attached thereto, each of the actuated mirrors in the arrays being capable of changing the optical path of the primary light beams reflected therefrom;

a source stopper, provided with a light transmitting portion having a specific configuration and a light stopping portion and being placed on the first optical path on the first optical plane, for shaping the white light from the non-point white light source into a predetermined configuration; a source lens, disposed between the source stopper and the non-point white light source, for focussing the white light emitted by the non-point white light source onto the source stopper;

an optical means including a first and a second dichroic mirrors, for isolating each of the primary light beams in the white light from the source stopper and illuminating each of the primary light beams to the corresponding array of actuated mirrors, wherein the first dichroic mirror, disposed between the source stopper and the first array of actuated mirrors facing the second dichroic mirror, is used for isolating one of the primary light beams, transmitting thereof to the first array of actuated mirrors and reflecting the remaining two primary light beams onto the second dichroic mirror disposed between the first dichroic mirror and the third array of actuated mirrors facing the second array of actuated mirrors, and the second dichroic mirror, upon receiving the remaining two primary light beams from the first dichroic mirror, isolates one of the two remaining primary light beams, reflects the isolated primary light beams onto the second array of actuated mirrors and transmits the remaining primary light beam to the third array of actuated mirrors;

a trinity of field lenses including a first, a second and third field lenses, each of the first, second and third field lenses being located between the first dichroic mirror and the first array of actuated mirrors, between the second dichroic mirror and the second array of actuated mirrors, and between the second dichroic mirror and the third array of actuated mirrors, respectively, wherein each of the field lenses is used for collimating each of the primary light beams onto the corresponding array

of actuated mirrors and for refocussing each of the primary light beams reflected from each of the actuated mirrors in each of the arrays;

a projection screen for displaying an image made of the M×N number of pixels thereon; a projection stopper, provided with a light transmitting portion and a light stopping portion, for passing a predetermined amount of the reflected primary light beams from the trinity of the arrays of M×N actuated mirrors; and

a projection lens for projecting the primary light beams from the projection stopper onto the projection screen, thereby displaying each of the pixels corresponding thereto.

5,486,882

IMAGE PROJECTING APPARATUS

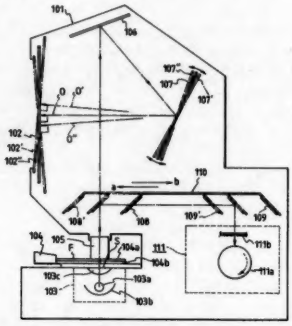
Yukuo Yamaguchi; Kazuhiko Onuki, both of Tokyo, and Kazuhide Sugiyama, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1994, Ser. No. 195,198

Claims priority, application Japan, Feb. 17, 1993, 5-051449; Feb. 25, 1993, 5-036584; Mar. 12, 1993, 5-052231

Int. Cl.[6] G03B *21/28*

U.S. Cl. 353—77 **24 Claims**



1. An image projecting apparatus comprising:

illuminating means disposed in an apparatus body for illuminating an image carrying member;

a screen disposed in said apparatus body such that an inclination angle of said screen can be adjusted;

an optical system for projecting an image of said image carrying member illuminated by said illuminating means on said screen, said optical system including at least one mirror with an adjustable inclination angle; and

means for inclining said screen and said mirror, with said inclining means inclining said mirror in accordance with inclination of said screen so that said screen and said mirror may be inclined at different angles from each other.

5,486,883

TRANSPARENCY PROTECTOR

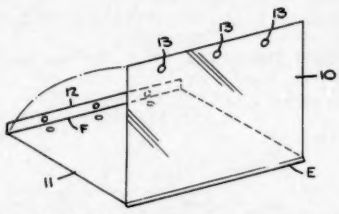
Thomas A. Candido, Hauppauge, N.Y., assignor to Enbee Plastics, Inc., Long Island City, N.Y.

Filed Mar. 3, 1993, Ser. No. 25,619

Int. Cl.[6] G03B *21/64*

U.S. Cl. 353—120 **4 Claims**

1. A composite protector adapted to accommodate a transparency to maintain it in a clean, dust-free and dry condition so that it may be used with an overhead optical projector to cast the image carried by the transparency onto a viewing screen, the protector comprising an open-ended rectangular sleeve whose dimensions are appropriate to those of the transparency, the sleeve including a front panel formed of transparent, acetate film of relatively low



strength that is breathable to permit a transparency inserted in the sleeve in a wet state to dry out, a rear panel formed of a transparent, synthetic-plastic film of high strength having the same length as the front panel and joined thereto at one side edge to form a folder to receive the transparency so that it is then sandwiched between the panels, the width of the rear panel being greater than that of the front panel to form a high strength flap that is folded over to define at the other edge of the sleeve a margin, said margin being provided with a set of punch holes whereby the transparency-loaded protector can be kept when not in use in a ring binder, said rear panel being formed of polypropylene.

5,486,884

REFLECTING IMAGE PROJECTION SCREEN AND IMAGE PROJECTION SYSTEM COMPRISING SUCH A SCREEN

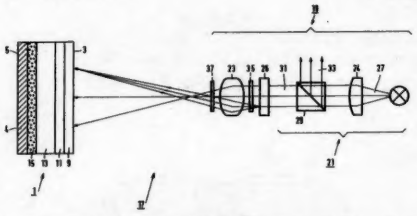
Adrianus J. S. M. De Vaan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 25, 1994, Ser. No. 218,482

Claims priority, application Belgium, Jan. 6, 1993, 09301042

Int. Cl.[6] G03B *21/00*

U.S. Cl. 353—122 **15 Claims**



1. A reflecting image projection screen comprising a linear polarizer and a reflecting layer for reflecting radiation which is incident on the reflecting layer via the polarizer, characterized in that the reflecting layer is a depolarizing diffuser layer and in that the image projection screen includes a cholesteric filter between the polarizer and the reflecting layer and a λ/4 plate between the polarizer and the cholesteric filter, the direction of polarization of the radiation from the cholesteric filter corresponding to the direction of polarization of the polarizer after conversion by the λ/4 plate.

5,486,885

CHARACTER IMAGE DISPLAY APPARATUS FOR A CAMERA

Fumiharu Matsumoto, 4-802, 31, 1-chome, Hon-cho, Nakano-Ku, Tokyo, Japan

Filed Mar. 7, 1994, Ser. No. 206,878

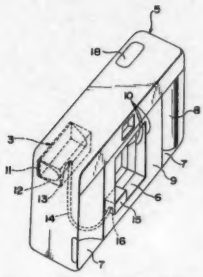
Claims priority, application Japan, Mar. 5, 1993, 5-014623 U

Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 **6 Claims**

1. A character image display apparatus for a camera, comprising:

a camera body having a film exposure portion and a film plane;



a flash unit having a reflector for illuminating a subject being photographed, the flash unit being housed on the camera body;

a light guide having an end thereof connected to the reflector through a hole in the reflector, thereby light emitted from the flash unit being transmitted through said light guide;

a diffusion block fixed to the camera body within the exposure portion of the body, the diffusion block having a display plane substantially parallel to the film plane of the camera body, and a positive film of a display image being disposed on said display plane and thereby facing the film plane of the camera body, and an opposite end of the light guide disposed in the diffusion block such that during the photographic process light from the flash unit is introduced through the light guide to the diffusion block to uniformly illuminate the display image and thereby the display image being simultaneously photographed with a subject being photographed.

5,486,886

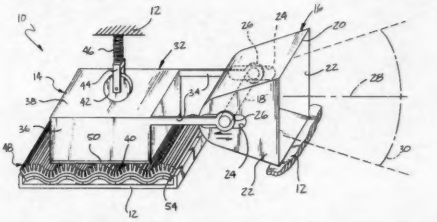
VARIABLE ANGLE FLASH WITH LINEAR MOTOR DRIVE

Mikhail Vaynshteyn, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1994, Ser. No. 210,984

Int. Cl.[6] G03B *15/05*

U.S. Cl. 354—149.1 **9 Claims**



1. A variable angle flash apparatus for a photographic camera comprising a light source member and a reflector member which are relatively movable along an optical axis for focusing light from said source with a desired illumination angle and means for varying the distance along said axis between said light source and said reflector for changing said illumination angle, is characterized in that:

said means for varying the distance between said light source and said reflector includes a follower connected with one of said light source and reflector members, said follower being movable along a linear path parallel with said optical axis for moving said one member relative to the other member along said axis, said follower being connected with a movable part of a linear motor having a second part fixed with respect to said other of the light source and reflector members, said linear motor being operative when energized to move said follower along said linear path, thereby varying the distance between the light source and reflector members and changing the illumination angle of the flash.

5,486,887

PHOTOGRAPHIC CAMERA WITH STROBE

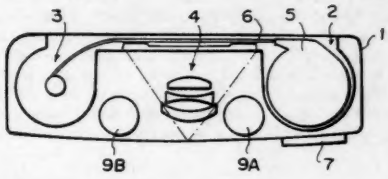
Akio Omiya, Saitama, Japan, assignor to Fuji Photo Optical Co., Ltd., Ohmiya, Japan

Filed Sep. 15, 1994, Ser. No. 305,315

Claims priority, application Japan, Jan. 14, 1993, 5-256782

Int. Cl.[6] G03B *15/03;17/02*

U.S. Cl. 354—149.11 **4 Claims**



1. A photographic camera comprising a film magazine chamber, a film-take-up spool chamber, an optical system disposed between the film magazine chamber and the film-take-up spool chamber and a strobe energized by a strobe driving circuit, wherein the strobe driving circuit includes a plurality of capacitors for accumulating charge from a power source, said plurality of capacitors being disposed in a space between the optical system and at least one of the film magazine chamber and the film-take-up spool chamber such that the capacitors do not interfere with a light bundle entering the optical system and emanating therefrom.

5,486,888

CAMERA

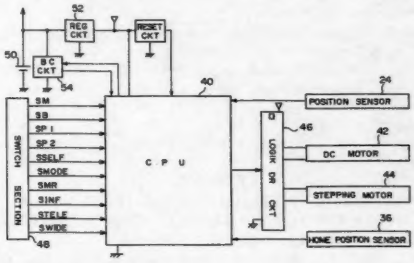
Michihiro Shiina; Jun'ichi Iwamoto, and Fumio Iwai, all of Oomiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed May 12, 1994, Ser. No. 242,019

Claims priority, application Japan, May 14, 1993, 5-113437

Int. Cl.[6] G03B *3/10;17/04*

U.S. Cl. 354—187 **19 Claims**



1. A camera comprising:

a camera body;

a lens barrel arranged as movable backward and forward relative to said camera body;

a first motor for driving said lens barrel;

a front lens group coaxially mounted in a front end portion of said lens barrel;

a rear lens group coaxially disposed in said lens barrel behind said front lens group so as to be independently movable backward and forward;

a second motor for driving said rear lens group; and

a lens barrel storage control apparatus for controlling said first motor and said second motor in storing said lens barrel at a retracted position in said camera body, said lens barrel storage control apparatus including first means for driving said second motor to locate said rear lens group at a predetermined standby position in said lens barrel, second means for detecting if said rear lens group is located at said standby position, third means for driving said first motor to retract said lens barrel to the retracted position in said camera body while keeping said rear lens group at said standby position when said second means detects that said rear lens group is located at said standby position, and fourth means for driving said first motor to locate said lens barrel at a suitable position within a range where said lens barrel can be set in a photographable state when said second means detects that said rear lens group is not located at said standby position.

5,486,889

LENS BARRIER MECHANISM FOR USE IN A CAMERA

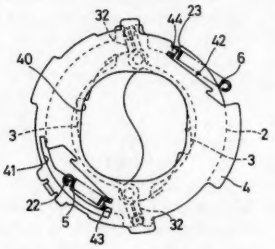
Dai Shintani, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 13, 1994, Ser. No. 274,444

Claims priority, application Japan, Jul. 14, 1993, 5-173887

Int. Cl.[6] G03B *17/00*

U.S. Cl. 354—202 **9 Claims**



1. A lens barrier mechanism comprising:

a barrier blade arranged in front of a lens for opening and closing a photographic optical path;

a barrier driver plate for driving said barrier blade;

a spring for pushing said barrier blade in a predetermined direction,

wherein a space constituted by a cutout or a through hole is formed in said barrier driver plate at a position which does not interfere with an opening and closing locus of said barrier blade and wherein said spring is arranged in the space.

5,486,890

SYSTEM FOR CONTROLLING THE TEMPERATURES OF PROCESSING SOLUTIONS IN PHOTOSENSITIVE MATERIAL PROCESSORS

Fumio Mogi, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

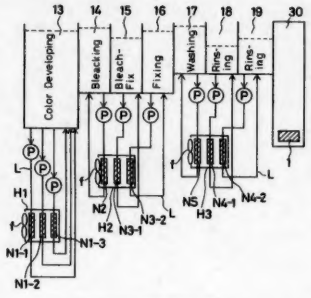
Filed Jul. 21, 1994, Ser. No. 278,221

Claims priority, application Japan, Jul. 26, 1993, 5-183687

Int. Cl.[6] G03D *13/00*

U.S. Cl. 354—299 **8 Claims**

1. In a photosensitive material processor including a plurality of tanks for processing photosensitive material and a drier, a system for controlling the temperatures of processing solutions in said processor characterized in that at least one processing tank is provided with a plurality of independently controllable electric heaters capable of heating the processing solution therein.



5,486,891

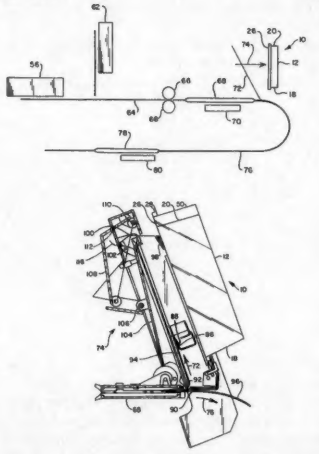
ECOLOGICAL SYSTEM FOR DELIVERING FILM UNITS, A CONTAINER FOR HOLDING FILM UNITS AND AN APPARATUS FOR PACKAGING TRASH FOR RECYCLING

Arthur S. Rousmaniere, Andover, and Frederick Slavitter, Needham, both of Mass., assignors to Polaroid-Corporation-Patent Department, Cambridge, Mass.

Filed Oct. 14, 1994, Ser. No. 324,030

Int. Cl.[6] G03D *9/00*

U.S. Cl. 354—301 **51 Claims**



1. A process for developing film and disposing of the residue, comprising the steps of:

mating a positive film sheet with an exposed negative film sheet;

spreading a layer of processing liquid between said sheets,

peeling said negative film sheet and any residual portion of said liquid from said positive film sheet, after allowing a suitable period of time for said processing liquid to work;

pushing said peeled negative film sheet and residual liquid into a trash container; and

sealing said container for shipment to a recycling and disposal location.

5,486,892

CAMERA WITH VISUAL AXIS DETECTING DEVICE

Kenji Suzuki; Akira Ishizaki; Keiji Ohtaka; Yasuo Suda; Hidehiko Fukahori, all of Yokohama; Akihiko Nagano, Kawasaki; Kazuki Konishi, Hino, and Tokuichi Tsunekawa, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

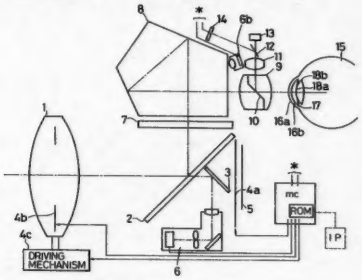
Continuation of Ser. No. 3,954, Jan. 19, 1993, abandoned, which is a continuation of Ser. No. 671,656, Mar. 19, 1991, abandoned, which is a continuation of Ser. No. 327,784, Mar. 23, 1989, abandoned. This application Oct. 28, 1994, Ser. No. 331,154

Claims priority, application Japan, Mar. 23, 1988, 63-070297; Apr. 26, 1988, 63-105298; Apr. 28, 1988, 63-108808; Mar. 16, 1989, 1-64630

Int. Cl.[6] G03B *5/00;13/36;17/20*

U.S. Cl. 354—402 39 Claims

1. A camera or a camera body comprising:



finder means for inspecting an object;

illumination means for illuminating an operator's eye looking into the finder means;

a condensing optical system for condensing light reflected from the operator's eye;

photoelectric converter means for receiving the condensed reflected light;

calculation means for calculating the direction of a visual axis of the operator's eye on the basis of an output of said photoelectric converter means; and

condition setting means, having a light-receiving portion for receiving a light beam passing through an objective lens, operable in response to the result of the calculation of said calculation means, for setting a photographing condition of the camera, wherein said condensing optical system includes an image reduction system and said photoconverter means includes a member in which pixels are two-dimensionally arranged.

5,486,893

CAMERA HAVING A DISPLAY FOR PREDICTED IMAGES

Tadao Takagi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 312,985, Oct. 3, 1994, abandoned, which is a continuation of Ser. No. 133,798, Oct. 8, 1993, abandoned, which is a continuation of Ser. No. 822,954, Jan. 21, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 456,371

Claims priority, application Japan, Feb. 4, 1991, 3-035725

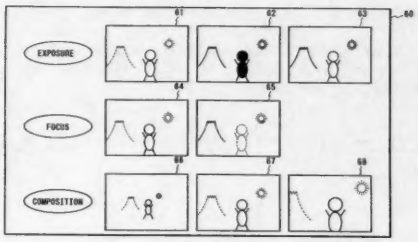
Int. Cl.[6] G03B *7/00;13/02*

U.S. Cl. 354—410 25 Claims

1. A camera having a predicted image displaying device including:

a setting device which sets control values of different photographing information manually or automatically;

a predicting circuit which predicts image signals for the same photographing scene based on at least one control value



among the control values of the photographing information set by said setting device;

an image storing device which stores the image signals predicted by said predicting circuit;

a displaying device which displays a plurality of images based on the image signals stored by said image storing device;

a selecting device which selects at least one image among a plurality of the images displayed by said displaying device; and

a photographing device which performs photographing on the basis of the control values of the photographing information for the image selected by said selecting device.

5,486,894

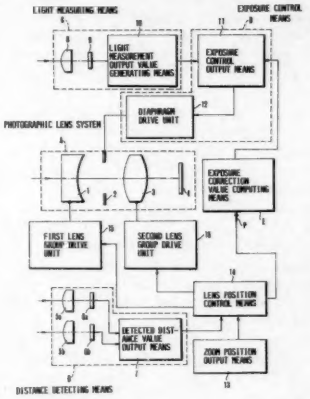
CAMERA WITH EXPOSURE CONTROL INTERLOCKED WITH LENS MOVEMENT

Kazuo Fujibayashi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 968,253, Oct. 29, 1992, abandoned. This application Apr. 26, 1995, Ser. No. 427,882

Int. Cl.[6] G03B *3/10;7/08*

U.S. Cl. 354—446 7 Claims


LIGHT MEASURING MEANS
EXPOSURE CONTROL MEANS
LIGHT MEASUREMENT OUTPUT VALUE GENERATING MEANS
EXPOSURE CONTROL OUTPUT MEANS
DIAPHRAGM DRIVE UNIT
PHOTOGRAPHIC LENS SYSTEM
EXPOSURE CORRECTION VALUE COMPUTING MEANS
FIRST LENS GROUP DRIVE UNIT
SECOND LENS GROUP DRIVE UNIT
LENS POSITION CONTROL MEANS
DETECTED DISTANCE VALUE OUTPUT MEANS
ZOOM POSITION OUTPUT MEANS
DISTANCE DETECTING MEANS

1. A camera comprising:

(a) a first lens group for controlling zooming operation;

(b) a diaphragm arranged behind said first lens group for controlling exposure operation;

(c) a second lens group arranged behind said diaphragm, for a focusing operation and said zooming operation;

(d) light measuring means for measuring light intensity, said light measuring means being separately arranged from said first and second lens groups;

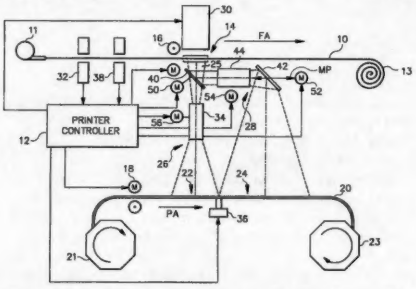
(e) exposure control means for controlling said diaphragm on the basis of an output of said light measuring means; and

(f) correction means for correcting said exposure according to a position of said second lens group at least in infinite distance when in said zooming operation.

5,486,895
OPTICAL SYSTEM FOR PRINTING NORMAL AND PANORAMIC IMAGES

Carl F. Leidig; Lee R. Estelle, both of Rochester, and William E. Moore, II, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 22, 1994, Ser. No. 231,418
Int. Cl.[6] G03B 27/52
U.S. Cl. 355—50 **24 Claims**



1. A method of printing first and second format image frames from a negative filmstrip onto elongated, continuous, photographic print paper having a selected width at magnifications related to the selected paper width comprising the steps of:

advancing a negative filmstrip having first or second format image frames in a film transport path including an exposure gate for supporting a filmstrip image frame to be printed and a light source for projecting light through an image frame in the exposure gate to provide an image bearing light beam;

determining if an image frame of said negative filmstrip in said transport path to be printed in said printer exposure gate is of said first or second format;

upon determining that said image frame is of said first format:

advancing in a paper advance direction and positioning a first unexposed length of said elongated, continuous, photographic print paper in a first format projection plane centered with respect to a first format projection path, said first format projection plane having a width corresponding to the selected paper width and a first format projection plane length;

operating said light source to project light through the first format image frame in said exposure gate to provide a first format image bearing light beam;

focusing and magnifying said first format image bearing light beam in said first format projection path, at a selected first format image frame magnification related to the selected paper width, onto said photographic print paper in said first format projection plane, thereby defining a first format, projection plane length boundary at said selected first image frame magnification; and

upon determining that the image frame is of said second format:

advancing in said paper advance direction and positioning a second unexposed length of said elongated, continuous, photographic print paper in a second format projection plane displaced, in the paper advance direction, entirely in a non-overlapping manner from said first format projection plane, said second format projection plane centered with respect to a second format projection path and having a width corresponding to the selected paper width and a second format projection plane length;

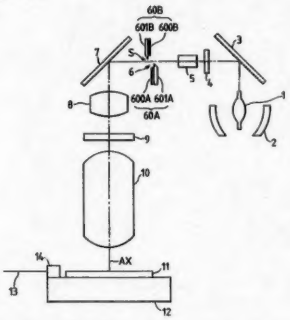
positioning a second format, adjustable magnification, optical system with respect to said image bearing light beam to project a second format image bearing light beam in said second format projection path; and

operating said light source to project light through the second format image frame in said exposure gate to provide said second format image bearing light beam for projection through said second format optical system and through said second format projection path onto said photographic print paper in said second format projection plane, displaced apart from said first format projection plane, at a selected second image frame magnification related to the selected paper width, thereby defining a second format, projection plane length boundary at said selected second image frame magnification substantially coinciding with said first format, projection plane length boundary.

5,486,896
EXPOSURE APPARATUS

Junji Hazama; Masamitsu Yanagihara, both of Yokohama; Hideji Goto, Kawasaki, and Masaichi Murakami, Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 14, 1994, Ser. No. 195,192
Claims priority, application Japan, Feb. 19, 1993, 5-030150; Apr. 12, 1993, 5-084764; Jun. 11, 1993, 5-140974
Int. Cl.[6] G03B 25/72
U.S. Cl. 355—71 **13 Claims**



1. An exposure apparatus comprising:

an illumination optical system for irradiating at least one mask with a light beam from a light source;

a projection optical system for projecting images of patterns on said at least one mask, illuminated by said light beam, onto a photosensitive substrate; and

light attenuation means disposed in a position in said illumination optical system that is substantially conjugate with said at least one mask, said attenuation means decreasing an amount of light in a peripheral portion of an image of a pattern projected onto said photosensitive substrate, as the distance from the center of said image increases.

5,486,897
DECORATIVE CARDS

Shakar Z. Mohmand, P.O. Box 49503, Omariya, Kuwait

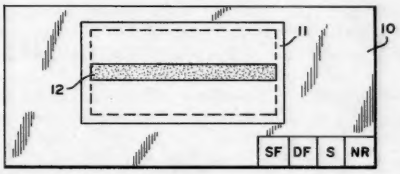
Continuation of Ser. No. 751,666, Aug. 23, 1991, abandoned, which is a continuation of Ser. No. 576,138, Aug. 24, 1990, abandoned, which is a continuation of Ser. No. 356,530, May 24, 1989, abandoned. This application Jul. 28, 1993, Ser. No. 97,928
Claims priority, application United Kingdom, May 27, 1988, 8812622
Int. Cl.[6] G03B 27/02
U.S. Cl. 355—132 **11 Claims**

1. A method of manufacturing a card bearing an image comprising the steps of:

a) providing an image;

b) transferring the image to an original microfiche having a plurality of discrete frames using a microfiche duplicating apparatus including a microfilm camera, wherein the image extends over a plurality of the discrete frames, by the steps of:

i) providing a master alignment strip on a copy board such that the master alignment strip extends across a field of the



microfilm camera, the master alignment strip having opposite parallel sides bounding the width of the master alignment strip;

ii) providing each portion of the image to appear in a single frame of the original microfiche with an image alignment strip having a width equal to the width of the master alignment strip;

iii) aligning a portion of the image to appear in a single frame such that the image alignment strip is coincident with the master alignment strip;

iv) photographing the aligned portion of the image onto the original microfiche; and,

v) repeating steps iii) and iv) until the entire image has been transferred to the original microfiche whereby the discrete frames cooperate to form the complete image;

c) transferring the image on the original microfiche to one side of a second microfiche which is to be viewed from an opposite side; and,

d) affixing a protective layer on the one side so as to protect the transferred image.

5,486,898

COLOR IMAGE FORMING APPARATUS WITH PHOTORECEPTOR PROTECTOR

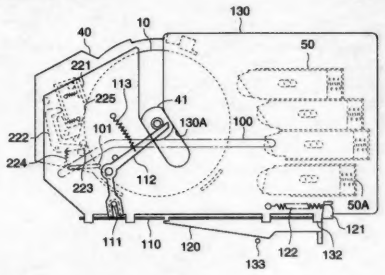
Yozo Fujii; Hiroyuki Moriguchi; Yoshikazu Ikunami; Masahiko Matsunawa; Akihiko Tamura; Kazuo Yasuda; Tadashi Miwa; Tatsumi Horiuchi; Tadao Kishimoto; Yoshihide Fujimaki; Hiroyuki Takagiwa, and Takashi Tamura, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 8, 1994, Ser. No. 272,331

Claims priority, application Japan, Jul. 14, 1993, 5-174570; Nov. 29, 1993, 5-298361; Nov. 29, 1993, 5-298367

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—200 **25 Claims**



1. A color image forming apparatus, comprising:

an image retainer having an image retaining surface on which a color toner image is retained;

a charger for charging the image retaining surface;

an exposure device for forming a latent image on the charged image retaining surface;

a plurality of developing devices for developing the latent image on the image retaining surface so as to form a toner image;

a transferring device for transferring the toner image from the image retaining surface at a transfer section to a recording sheet;

a conveyor for conveying the recording sheet to the transfer section on the transferring device;

a cleaner for cleaning residual toner on the image retaining surface;

a holder for holding the image retainer, the charger, the plurality of developing devices and the cleaner in one body;

a housing;

a support for supporting the holder dismountably in the housing so that the holder is drawable out from a first position at which the holder is set in the housing to a second position at which jam disposition is conducted, wherein the holder is drawable out of the housing in a direction parallel to a recording sheet-conveying direction of the conveyor; and

a member comprising a manual feed tray forming a portion of the apparatus, the member covering the image retaining surface at the transfer section when the holder is at the second position.

5,486,899

IMAGE FORMING APPARATUS HAVING A FUNCTION OF IDENTIFYING A TONER CARTRIDGE

Akiro Iimori, and Kazushige Morihara, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

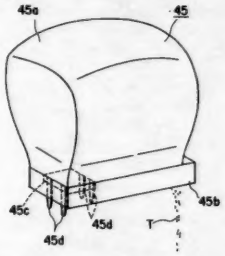
PCT No. PCT/JP93/00059, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO93/15445, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 20, 1993, Ser. No. 256,351

Claims priority, application Japan, Jan. 22, 1992, 4-009180; Sep. 24, 1992, 4-254873

Int. Cl.[6] G03G *15/00;15/06*

U.S. Cl. 355—203 **7 Claims**



1. An image forming apparatus having a developing device designed to develop an electrostatic latent image formed on an image carrier, by supplying a developing agent onto the electrostatic latent image, characterized by comprising:

a developing-agent replenishing device detachably connected to said developing device and comprising:

a storage section for storing a developing agent;

a supply section for supplying the developing agent from said storage section to said developing device;

first input means for receiving a first data signal;

memory means storing a plurality of processing rules based on which the first data signal input through said first input means is is to be processed;

processing means for performing a processing on the first data signal input from said first input means, based on the processing rules stored in said memory means, thereby to generate a second data signal; and

a first output means for outputting the second data signal generated by said processing means; and

generating means for generating data for selecting a specific one of the plurality of processing rules stored in said memory means;

second output means for outputting to said first input means the data generated by said generating means for selecting the specified one of the plurality of processing rules and also the first data signal when said developing-agent replenishing device is connected to said developing device;

second input means for receiving the second data signal generated by said processing means and output from said first output means, when said developing agent replenishing device is connected to said developing device; and

discriminating means for comparing the second data signal input through said second input means with the first data signal, thereby to discriminating conformability of said developing-agent replenishing device, when said developing-agent replenishing device is connected to said developing device.

5,486,900

MEASURING DEVICE FOR AMOUNT OF CHARGE OF TONER AND IMAGE FORMING APPARATUS HAVING THE MEASURING DEVICE

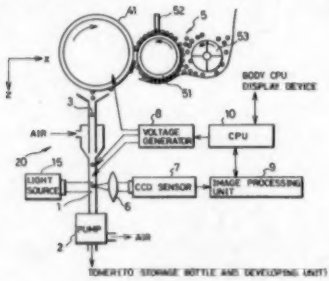
Takasumi Wada, Nara; Keiji Taniguchi, Fukui, and Yoichi Yamamoto, Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 5, 1994, Ser. No. 349,663

Claims priority, application Japan, Dec. 6, 1993, 5-305577

Int. Cl.[6] G01R *29/24;* **G03G** *15/08*

U.S. Cl. 355—203 **16 Claims**



1. A measuring device for an amount of charge of toner, comprising:

countered first and second electrodes for forming an electric field which accelerates toner particles;

a voltage generator for applying a voltage across said first and second electrodes;

a magnifying optical system for magnifying an image of the toner particles which move between said first and second electrodes;

a light source for illuminating a vicinity of a focus of said magnifying optical system

a CCD sensor for receiving an optical image of the toner particles magnified by said magnifying optical system so as to convert the optical image into an image signal; and

control means for controlling a voltage from said voltage generator based upon the image signal so that the toner particles pass a prescribed position in the vicinity of the focus of said magnifying optical system and for obtaining an amount of charge of toner particles from a value of the voltage.

5,486,901

COLOR IMAGE RECORDING APPARATUS WITH A DETECTOR TO DETECT A SUPERIMPOSED TONER IMAGE DENSITY AND CORRECTING ITS COLOR BALANCE

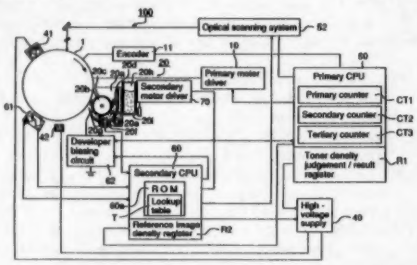
Masakazu Fukuchi; Shizuo Morita; Shizuo Kayano, and Kunihisa Yoshino, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 8, 1993, Ser. No. 27,871

Claims priority, application Japan, Mar. 10, 1992, 4-087667; Apr. 14, 1992, 4-121437; May 15, 1992, 4-148429

Int. Cl.[6] G03G *15/01*

U.S. Cl. 355—208 **20 Claims**



1. A method of forming yellow, magenta and cyan color toner images on a photoreceptor, comprising the steps of:

charging a photoreceptor to a charged electric potential;

exposing the photoreceptor so as to form a reference latent image for each of three colors with an exposure light having a reference image density;

developing the reference latent images respectively with yellow, magenta and cyan color toners so as to form a superimposed three color toner image;

separating a reflected light obtained from the superimposed three color toner image formed on the photoreceptor into a plurality of separate colors;

detecting a color balance between the superimposed three color toner images from the separated colors; and

consuming at least one color toner of the yellow, magenta and cyan color toners in accordance with a detection result of the color balance so that a new color balance of the superimposed three color toner images will have a desired color balance.

5,486,902

COLOR IMAGE FORMING APPARATUS FOR FORMING COLOR IMAGE BY TRANSFERRING COLOR TONER TO TRANSFER MATERIAL

Akira Ito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1994, Ser. No. 200,691

Claims priority, application Japan, Feb. 24, 1993, 5-059750

Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—208 **8 Claims**

1. An image forming apparatus comprising:

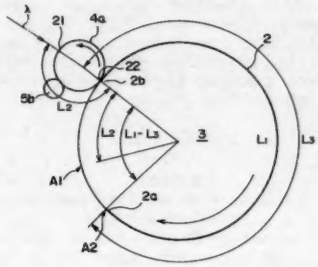
a rotary photosensitive member;

charge means for charging said photosensitive member;

exposure means for image-exposing said photosensitive member charged by said charge means at an exposure station to thereby form an electrostatic image;

a plurality of developing device for developing the electrostatic image on said photosensitive member;

changing means for changing said developing devices to be used for developing the electrostatic image; and



a transfer rotary member onto which the developing image on said photosensitive member is transferred at a transfer station;

wherein defining a peripheral length of said transfer rotary member is L_1, a distance between the exposure station and the transfer station is L_2, and a maximum transfer length in a moving direction of said photosensitive member is L_3, the relation of $(L_1-L_3)>L_2$ is established; and said changing means changes said developing devices between a completion of the transferring and start of a next image exposure.

5,486,903

IMAGE FORMING APPARATUS WITH PAPER THICKNESS DETECTOR

Satoru Kanno, Yokohama; Toru Katsumi, Kawasaki, and Ikuo Takeuchi, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1994, Ser. No. 271,679

Claims priority, application Japan, Jul. 16, 1993, 5-176494

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—208 **6 Claims**

1. An image forming apparatus comprising:

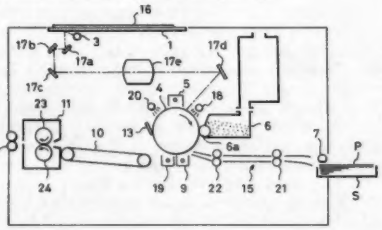


image forming means for forming an image on a recording material;

an air capacitor comprising two opposing conductor plates spaced at a predetermined distance larger than the thickness of the recording material; and

control means for controlling an image forming condition made by said image forming means on the basis of an electrostatic capacity when the recording material is inserted between the conductor plates.

5,486,904

METHOD FOR DETERMINING RESIN PARTICLES IN PAPER STOCKS

Dieter Horn, Heidelberg; Erik Lueddecke, Mutterstadt; Alfred Gierulski, Heidelberg-Ziegelhausen; Thomas Kroehl, Mainz, and Primoz Lorencak, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP91/02350, § 371 Date Jun. 7, 1993, § 102(e) Date Jun. 7, 1993, PCT Pub. No. WO92/11534, PCT Pub. Date Jul. 9, 1992

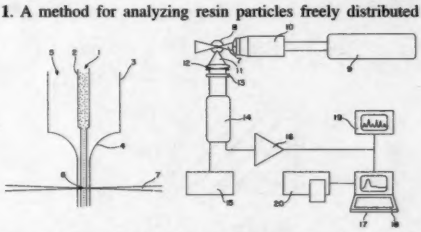
PCT Filed Dec. 9, 1991, Ser. No. 70,414

Claims priority, application Germany, Dec. 18, 1990, 40 40 463.3

Int. Cl.[6] G01N *21/64;33/34;15/14*

U.S. Cl. 356—73 **5 Claims**

1. A method for analyzing resin particles freely distributed in



paper stock to determine the number and size of the particles which comprises: forming a suspension of the paper stock in water; separating the resin particles from the suspension by filtration; marking the separated particles with a fluorescent dye; isolating the marked particles; exciting the particles to produce light emission signals, and detecting the light emission signals and evaluating the signals to count the marked particles and to determine the size of the marked particles.

5,486,905

DEVELOPING AGENT RECOVERY APPARATUS AND IMAGE FORMING APPARATUS USING SUCH RECOVERY APPARATUS

Atsushi Takeda; Michiro Koike, both of Kawasaki; Hironobu Saito, Yokohama, and Toru Katsumi, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

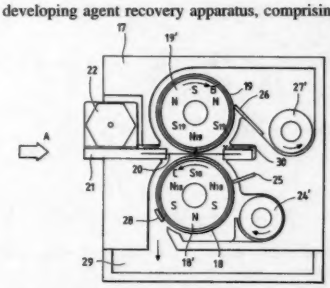
Filed Jan. 31, 1994, Ser. No. 188,883

Claims priority, application Japan, Feb. 1, 1993, 5-034008; May 10, 1993, 5-108231; Jun. 29, 1993, 5-158964

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—215 **20 Claims**

1. A developing agent recovery apparatus, comprising:



recovery means for recovering a magnetic toner from a mixture of said magnetic toner and foreign substances, said recovery means having magnetic force generating means for generating a magnetic force to attract the magnetic toner, and a filter for preventing substances other than said magnetic toner of said mixture from passing therethrough, said filter being disposed

in a region in which said magnetic toner is moved by said magnetic force generating means,

wherein said magnetic force generating means is disposed upstream of said filter in a gravity working direction.

5,486,906

CONTACT CHARGER AND IMAGE FORMING APPARATUS COMPRISING THE SAME

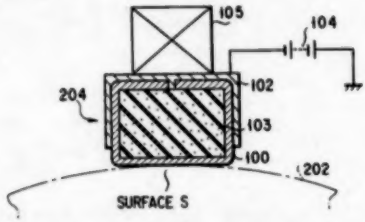
Kenichi Tsuneeda, Yokohama; Sachiko Yoshida, and Masato Ogasawara, both of Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 10, 1994, Ser. No. 194,524

Claims priority, application Japan, Mar. 23, 1993, 5-062366

Int. Cl.[6] G03G *15/02*

U.S. Cl. 355—219 **24 Claims**



1. A contact charger for charging an object, comprising:

conductive nonwoven fabric in surface contact with the object;

voltage applying means for applying a voltage to the conductive nonwoven fabric so as to charge the object; and

pressing means for pressing the conductive nonwoven fabric against the object under a surface contact pressure of 0.1 to 10 gf/mm^2.

5,486,907

BRUSH CHARGING DEVICE FOR AN IMAGE FORMING APPARATUS AND A METHOD FOR MANUFACTURING THE SAME

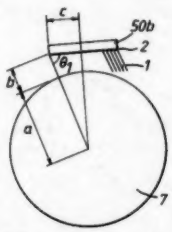
Takeshi Watanabe; Minoru Yoshida, both of Tokyo; Shigeru Fujiwara, and Masashi Takahashi, both of Kanagawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1994, Ser. No. 208,708

Claims priority, application Japan, Mar. 25, 1993, 5-066302

Int. Cl.[6] G03G *15/02*

U.S. Cl. 355—219 **3 Claims**



1. A brush charging device for an image forming apparatus wherein the brush charging device charges a surface of an image carrier rotating in a predetermined direction comprising:

a linear mount member;

a base cloth mounted on the mount member; and

a brush member having fibers mounted on the base cloth at an angle θ_1, the angle θ_1 satisfying the following formula:

$$\cos\theta_1 > c/(a+b)$$

wherein a represents the radius of the image carrier, b represents the length of the brush fibers and c represents the distance between a point of intersection where a perpendicular line extending from the center of the image carrier to the base cloth intersects the base cloth and an edge portion of the base cloth located upstream going in the direction of the image carrier and where the brush fibers contact the surface of the image carrier.

5,486,908

FIXING UNIT HAVING HEATING ROLLER AND PRESSURE ROLLER

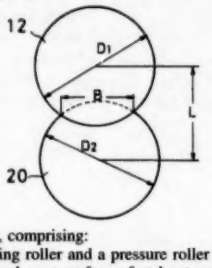
Takeshi Miyamoto; Kouji Okumura, and Motohiro Suzaki, all of Gifu, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 24, 1994, Ser. No. 248,478

Claims priority, application Japan, May 24, 1993, 5-121021

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—290 **12 Claims**



1. A fixing unit, comprising:

a pair of a heating roller and a pressure roller having an elastic member formed on a surface of at least one of said heating roller and the pressure roller, said heating roller and said pressure roller being brought into pressure-contact with each other in a state that said elastic member is elastically deformed; and

supporting means for rotatably supporting said heating roller and pressure roller at respective fixed positions such that a center distance L between said heating roller and pressure roller satisfies the following equation:

$$L=D1/2+D2/2-B^2/4\ (1/D1+1/D2)$$

where D1 is a diameter of said heating roller, D2 is a diameter of said pressure roller, and B is a nip width between said heating roller and said pressure roller.

5,486,909

DEVELOPING DEVICE FOR AN IMAGE FORMING APPARATUS

Eiji Takenaka, Isehara; Kazuhiro Yuasa, Zama; Shuichi Endoh, Isehara; Iwao Matsumae, Tokyo; Yoshiaki Tanaka, Kawasaki; Hiroshi Hosokawa, Yokohama; Mugijiroh Uno, Isehara; Hiroshi Saitoh, Ayase; Toshihiro Sugiyama, Atsugi; Tetsuo Yamanaka, Tokyo; Eisaku Murakami, Hiratsuka, and Satoru Komatsubara, Atsugi, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 11, 1995, Ser. No. 439,123

Claims priority, application Japan, May 13, 1994, 6-099991; Mar. 23, 1995, 7-064374

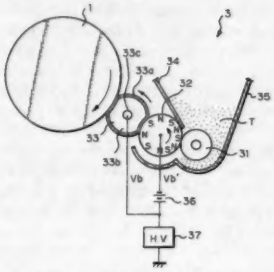
Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—259 **2 Claims**

1. A developing device for developing a latent image electrostatically formed on an image carrier by toner, comprising:

a first developing roller made of a relatively hard material and formed with fine N-S magnetic poles on a periphery thereof, and for conveying the toner magnetically deposited on said periphery;

a blade contacting said first developing roller, and for regulating an amount of the toner being conveyed by said first develop-



ing roller, and for charging said toner being passed through between said blade and said first developing roller by friction;

a second developing roller made of a material softer than the material of said first developing roller and held in contact with said first developing roller, and for causing the toner adequately charged to be electrostatically transferred from said first developing roller to said second developing roller, and for conveying said toner to the image carrier; and

a bias power source for applying a particular bias voltage to each of said first and second developing rollers;

wherein said second developing roller has a surface roughness whose ratio to a mean particle size of the toner is less than or equal to 1.5.

5,486,910

IMAGE FORMING APPARATUS HAVING PAPER FEEDING MECHANISM FOR FEEDING SHEET FROM SHEET A STORAGE PORTION TO AN IMAGE FORMING PORTION

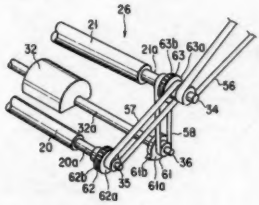
Kentaro Harada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 24, 1994, Ser. No. 201,242

Claims priority, application Japan, Mar. 26, 1993, 5-068907

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—309 **11 Claims**



1. An image forming apparatus comprising:

storage means for storing a plurality of sheets;

image forming means for forming an image on a sheet; and

paper feeding means for feeding the sheets one by one from the storage means to the image forming means,

the paper feeding means including a transportation path for guiding a fed sheet from the storage means to the image forming means, a first feed roller for delivering the fed sheet from the storage means to the transportation path, a second feed roller in the transportation path for transporting the fed sheet delivered by the first feed roller, a third feed roller for aligning the fed sheet delivered thereto by the second feed roller and transporting the fed sheet to the image forming means, and drive means for rotating the first feed roller, the second feed roller, and the third feed roller,

the drive means including a drive source, first transmission means for transmitting the driving force of the drive source to the third feed roller in an interruptible manner, second transmission means for transmitting the driving force of the drive source to the second feed roller in an interruptible manner, third transmission means for transmitting the transmitted driving force of the third feed roller to the first feed roller in an interruptible manner, a first locking member movable between a first locking position, in which the first locking member engages the first transmission means to interrupt transmission of the driving force by the first transmission means, and a transmission position, in which the first locking member is disengaged from the first transmission means, first switching means for shifting the first locking member between the first locking position and the transmission position, a second locking member movable between a second locking position, in which the second locking member engages the second transmission means to interrupt transmission of the driving force by the second transmission means, and a third locking position, in which the second locking member engages the third transmission means to interrupt transmission of the transmitted driving force by the third transmission means, and second switching means for shifting the second locking member between the second locking position and the third locking position.

5,486,911

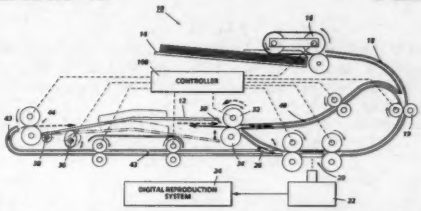
DOCUMENT HANDLER FOR IMAGING SYSTEM WITH PLURAL MODE OUTPUT TRAY

Robert F. Rubscha, Fairport, and Margaret C. Tsai, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 8, 1994, Ser. No. 352,017

Int. Cl.[6] G03G *21/00;* **B65H** *31/04*

U.S. Cl. 355—329 **3 Claims**



1. In a document handling system for feeding either simplex or duplex document sheets to be imaged at an imaging station, and for restacking the simplex or duplex document sheets in proper collated order in a single output stacking tray; including a reversible exit nip for the reversal of a duplex document sheet in said exit nip while extending therefrom before returning said duplex document sheet to said imaging station for the imaging of its second side, and for document sheet ejection and stacking into said output stacking tray from said exit nip without reversal, the improvement comprising:

a pivotable mounting system for said output stacking tray so that one end of said output stacking tray is pivotable from a position substantially below said reversible exit nip to a raised position above said reversible exit nip;

an unobstructed duplex document sheet reversing space under said output stacking tray in said raised position of said output stacking tray above said reversible exit nip; and

a control system for automatically pivoting said output stacking tray to said raised position above said exit nip for said reversal of said duplex document sheet in said reversible exit nip, so that said extension of said duplex document sheet from said exit nip occurs underneath said output stacking tray in said unobstructed duplex document sheet reversing space, said control system automatically pivoting said output stacking tray down to said position substantially below said exit nip for said ejection and stacking of document sheets in said output stacking tray from said exit nip.

5,486,912

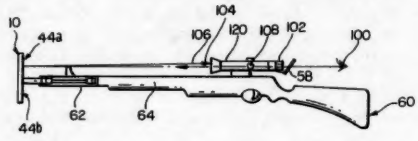
Patent Not Issued For This Number

5,486,913

BORESIGHT ASSEMBLY

Oren Aharon, Commack, N.Y., assignor to PLX, Inc., Deer Park, N.Y.

Filed Nov. 10, 1993, Ser. No. 150,416
Int. Cl.[6] G01B *11/26*; F41G *1/54*
U.S. Cl. 356—153 **19 Claims**



1. A boresight assembly for use by a user weapon to align said weapon, comprising:

a rod having a first longitudinal axis and being removably slidable within a bore of said weapon, said bore having a second longitudinal axis coaxial with said first longitudinal axis when said rod is within said bore; and

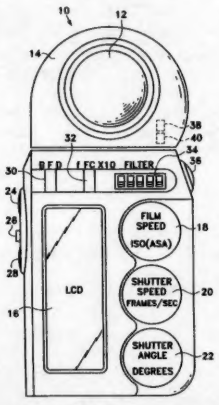
a reflecting member extending from said rod having at least one reflecting surface, wherein said at least one reflecting surface is substantially perpendicular to both said first and second longitudinal axes through said rod and said bore, respectively.

5,486,914

LCD BARGRAPH MOTION PICTURE LIGHT METER

Thomas F. Denove, Agoura Hills, and William L. Blowers, Newhall, both of Calif., assignors to GDB Enterprises, Inc., Burbank, Calif.

Continuation of Ser. No. 883,416, May 14, 1992, abandoned.
This application Jun. 27, 1994, Ser. No. 266,102
Int. Cl.[6] G01J *1/42*
U.S. Cl. 356—221 **25 Claims**



1. A cinematographic incident-illumination-sensing motion picture camera setup instrument for (a) sensing and registering a series of incident illumination readings made at a location of a cinematographic subject, (b) registering a group of user-entered settings of a motion picture camera for filming the subject, and (c) calculating therefrom and displaying for each illumination reading a corresponding f-stop setting for the motion picture camera, said instrument comprising:

a light-sensitive element, including a hemispheric wideangle lens, providing an electrical signal proportional to incident illumination readings taken at the location of a subject;

user control means comprising a plurality of user data entry switch units, for independent entry of quantitative data pertaining to a respective motion picture camera parameter and each provided with direct setting indication means, such that all entered data can be observed fully and directly;

an electronic processor receiving the signal from said light sensitive element and converting the signal into corresponding stabilized logarithmic display data including motion picture camera f-stop data as calculated by said processor from the signal and the user-entered switch settings, said electronic processor including memory means for temporarily storing data from a series of readings;

a vertically-oriented solid-state electro-optical display panel, constructed and arranged to receive and display the motion picture camera f-stop display data; and

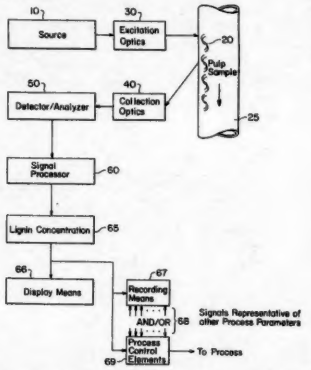
a hand-held housing containing said light-sensitive element, said electronic processor, said display panel, and said user control means.

5,486,915

ON-LINE MEASUREMENT OF LIGNIN IN WOOD PULP BY COLOR SHIFT OF FLUORESCENCE

Larry A. Jeffers, Washington Township, Stark County, and Michael L. Malito, Liberty Township, Trumbull County, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 12, 1994, Ser. No. 226,801
Int. Cl.[6] G01N *21/64*; D21C *7/14*
U.S. Cl. 356—318 **23 Claims**



1. An apparatus employing a color shift of fluorescence for measuring lignin concentration in at least one undiluted sample on a real-time, in-situ basis based upon a spectral distribution of fluorescent emission light from the sample, comprising:

light source means for applying excitation light at a selected wavelength to the at least one undiluted sample for causing the sample to produce fluorescent emission light having a spectral distribution of fluorescent intensity;

light detector means for detecting the fluorescent intensity of the emission light and determining the spectral distribution of fluorescent intensity and establishing signals indicative thereof;

signal processing means operatively connected to the light detector means for calculating a lignin concentration from the spectral distribution signals and producing a signal indicative thereof; and

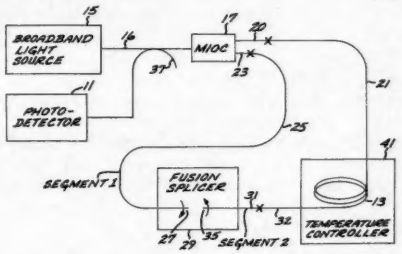
means for displaying the signal indicative of the calculated lignin concentration for viewing by an operator.

5,486,916

FIBER DEPOLARIZER USING HEATED FIBER COIL AND FUSION SPLICER AND TWO POLARIZATION PRESERVING FIBERS AND METHOD

Ronald J. Michal, Wrightwood; James R. Steele, Northridge, both of Calif., and Mark E. Jones, Blacksburg, Va., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 29, 1994, Ser. No. 282,684
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—345 **6 Claims**



1. The method of making a fiber depolarizer by splicing together the ends of two sections of polarization preserving fiber with their respective principal birefringent axes oriented at 45 degrees to each other, comprising the steps of:

using a reciprocal interferometer responsive to light from a broadband source to direct the light through a light polarizer and beam splitter over a first output to a single mode low birefringent fiber optical coil via an optical fiber in one direction;

inserting a fusion splicer, connected to the coil by a polarization preserving fiber and connected to the other output of the splitter by a further polarization preserving fiber for receiving light directed in the opposite direction;

heating the coil to increase its temperature while orienting the ends of the polarization preserving fibers in the fusion splicer;

sensing light returning from the beam splitter to detect a predetermined pattern of light intensity versus time; and,

fusing said ends upon the detection of said pattern.

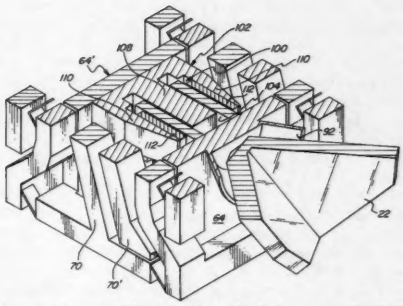
5,486,917

FLEXTURE PLATE MOTION-TRANSFER MECHANISM, BEAM-SPLITTER ASSEMBLY, AND INTERFEROMETER INCORPORATING THE SAME

Robert M. Carangelo, Glastonbury; Mark D. Dettori, Farmington; Lawrence J. Grigely, South Windsor, all of Conn.; Terence C. Murray, Winchester, Mass.; Peter R. Solomon, West Hartford, Conn.; C. Peter Van Dine, Bolton, Conn., and David D. Wright, Vershire, Vt., assignors to On-Line Technologies Inc, East Hartford, Conn.

Continuation-in-part of Ser. No. 837,622, Jan. 6, 1992, Pat. No. 5,349,438, which is a continuation-in-part of Ser. No. 773,225, Oct. 9, 1991, Pat. No. 5,196,902. This application Feb. 25, 1994, Ser. No. 201,757
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—346 **25 Claims**

1. A flexure plate, integrally formed as a single piece and constructed for assembly with at least one identical plate to provide a motion-transfer assembly, said plate being substantially planar and being substantially identical in orientations rotated 180° about an axis normal to its plane, said plate having lateral half-sections defined to the opposite sides of a transverse axis extending transversely through said normal axis, and having transverse half-sections defined to the opposite sides of a lateral axis extending laterally through said normal axis and perpendicular to said transverse axis, each of said lateral half-section comprising a mounting element and an elongate rocker element interconnected to said mounting element by a flexible connecting element that is so constructed and located as to permit said rocker element to rock



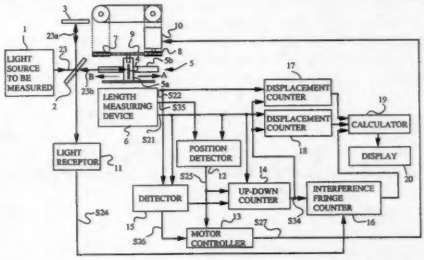
about a point on said lateral axis while being constrained to the plane of said plate, each of said transverse half-sections comprising a support element, each of said support elements and each of said rocker elements having opposite end portions, each of said opposite end portions of each support element being interconnected by a said connecting element to the one of said end portions of said rocker elements disposed therewith in each of said transverse half-sections, whereby said support elements can reciprocate in said plane along axes substantially parallel to said lateral axis as said rocker elements rock about said points thereon.

5,486,918

OPTICAL WAVELENGTH METER WITH AN UP-DOWN COUNTER WHICH MEASURES THE AMOUNTS OF THE OVERSHOOT AND THE BACK-SHIFT OF THE MOVING MIRROR

Shinya Nagashima, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1995, Ser. No. 389,397
Claims priority, application Japan, Feb. 28, 1994, 6-054586
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—346 **4 Claims**



1. An optical wavelength meter, wherein a wavelength of light to be measured is measured by an interferometer, the optical wavelength meter comprising:

a light source to be measured which outputs the light to be measured;

a beam splitter for splitting the light to be measured into two light portions;

a moving mirror for reflecting one portion of the two light portions to the beam splitter;

a linear moving mechanism for moving the moving mirror in one of the directions along the light axis of the light source by a motor;

a length measuring device, including a scale and a sensor, for outputting first and second pulse signals whose phases differ from each other when the moving mirror moves, each pulse corresponding to the resolution of displacement of the sensor, and for outputting an origin signal when the sensor passes the center of the scale;

a position detector for counting a predetermined number of waves of the first pulse signal by taking the origin signal from the length measuring device as a trigger signal, and for outputting a position signal when detecting that the moving mirror has moved a predetermined distance corresponding to the predetermined number;

a motor controller for outputting an inverting signal to the motor and outputting a direction signal of the present rotation of the motor when inputting the position signal from the position detector;

a state detector for detecting a state that the moving mirror is back shifted based on the direction signal of the rotation output from the motor controller and the first and second pulse signals from the length measuring device, and for outputting a detection signal; and

an up-down counter for inputting the first pulse signal from the length measuring device, position signal from the position detector, and the detection signal from the state detector; calculating a quantity of overshoot of the moving mirror based on the position signal and the first pulse signal, the overshoot being caused by inertial force of the motor occurring at the stopping of the motor when the motor receives the inverting signal from the motor controller; calculating a quantity of back-shift of the moving mirror occurring at the stopping of the motor based on the detection signal and the first pulse signal; conducting an inverse operation for the quantities of the overshoot and the back-shift when the motor starts to rotate by reversing the rotational direction, so as to detect a state in which the moving mirror reaches the position at which the inverting signal was input to the motor; and when detecting said state, outputting a starting signal for measuring the wavelength.

5,486,919

INSPECTION METHOD AND APPARATUS FOR INSPECTING A PARTICLE, IF ANY, ON A SUBSTRATE HAVING A PATTERN

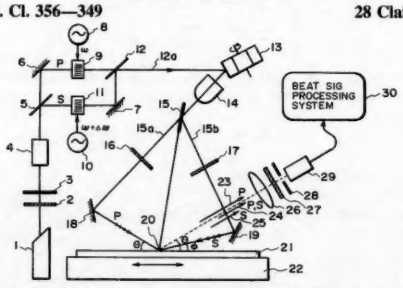
Toshihiko Tsuji, Ayase; Seiji Takeuchi, Kawasaki; Kyoichi Miyazaki, Mitaka; Minoru Yoshii, Tokyo; Noriyuki Nose, and Tetsuzo Mori, both of Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 900,736, Jun. 16, 1992, abandoned, and a continuation-in-part of Ser. No. 26,288, Mar. 4, 1993, abandoned. This application Jun. 15, 1993, Ser. No. 76,951

Claims priority, application Japan, Apr. 27, 1992, 4-107678; May 28, 1992, 4-136982; Jun. 16, 1992, 4-156842; Nov. 16, 1992, 4-305422; Nov. 16, 1992, 4-305433; Feb. 10, 1993, 4-022675; Mar. 9, 1993, 4-048064; Apr. 26, 1993, 4-099541

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—349 **28 Claims**



1. An inspection apparatus for inspecting a particle, if any, on a substrate having a pattern, said apparatus comprising:

light producing means for producing (i) first light having a first state of polarization and a first wavelength, and (ii) second light having a second state of polarization, different from the first state of polarization, and a second wavelength, different from the first wavelength;

light projecting means for projecting at least the first light to a position of inspection upon the substrate;

detecting means for detecting heterodyne interference light produced on the basis of the second light and light scattered at the inspection position and having its state of polarization changed, by the scattering, from the first state of polarization; and

inspecting means for inspecting a particle, if any, on the substrate on the basis of an output of said detecting means.

5,486,920

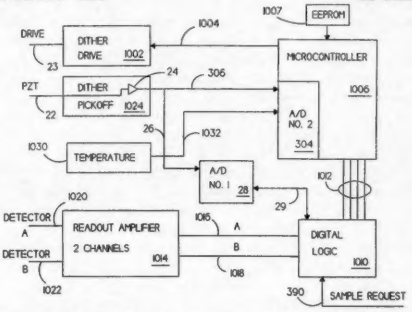
LASER GYRO DITHER STRIPPR GAIN CORRECTION METHOD AND APPARATUS

Joseph E. Killpatrick, Minneapolis; Dale F. Berndt, Plymouth; Keith R. Fritze, Long Lake, and Gregory E. Cary, Mounds View, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Oct. 1, 1993, Ser. No. 137,669

Int. Cl.[6] G01C *19/66*

U.S. Cl. 356—350 **22 Claims**



1. A method for determining a stripped change in gyro angle comprising the steps of:

(a) sensing a plurality of peak amplitudes P_1, P_2, $P_3 \ldots P_n$ from a dither drive signal wherein each of the plurality of peak amplitudes has corresponding times t_1, t_2, $t_3 \ldots t_n$;

(b) simultaneously sensing a plurality of ring laser gyro output angles at each of the corresponding times t_1, t_2, $t_3 \ldots t_n$; and

(c) determining a stripped change in gyro angle, $\Delta\phi$, according to a relationship wherein $\Delta\phi=(\phi_n-\phi_{n-1})-(\alpha_n-\alpha_{n-1})K$, where K is a correction factor, ϕ_n is an unstripped gyro angle sampled at time t_n and t_{n-1}, and α is a dither angle.

5,486,921

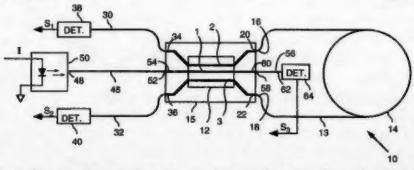
OPTIMUM COUPLER CONFIGURATION FOR FIBER OPTIC RATE GYROSCOPE USING [3×3] COUPLER

John F. Priest, Tomball, Tex., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Apr. 5, 1994, Ser. No. 223,049

Int. Cl.[6] G01C *19/22*

U.S. Cl. 356—350 **4 Claims**



1. A fiber optic rotation sensor for sensing rotation of a sensing

loop of optical fiber about a sensing axis perpendicular to the plane of the sensing loop, comprising:

a optical coupler that includes first, second and third optical waveguides formed in a substrate and arranged to have couping ratios such that the fractions of light coupled from any one of the first, second and third optical waveguides to the other two optical waveguides are constant, independent of temperature changes in the optical coupler

an optical signal source arranged to provide an input optical signal to the first optical waveguide such that portions of the input optical signal are coupled from the first optical waveguide into the second and third optical waveguides; and

the optical fiber in which the sensing loop is formed having ends that are coupled to the second and third optical waveguides to receive optical signals that form counterpropagating optical waves in the sensing loop and to combine the counterpropagating optical waves after they have traversed the sensing loop.

5,486,922

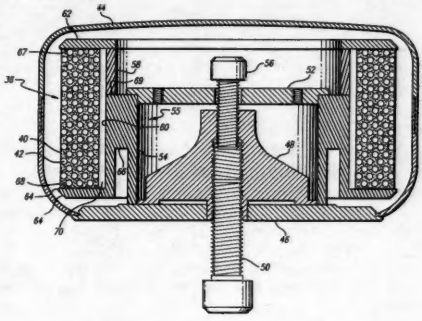
SENSOR COIL WITH THERMOMECHANICALLY-MATCHED SPOOL FOR FIBER OPTIC GYROSCOPE

Amado Cordova, West Hills, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Dec. 20, 1994, Ser. No. 359,424

Int. Cl.[6] G01C *19/64*

U.S. Cl. 356—350 **29 Claims**



1. A rotation sensor for use in a fiber optic gyroscope comprising, in combination:

a) a spool adapted to receive a coil comprising a plurality of layers of coaxial turns of a continuous optical fiber;

b) said coil being encapsulated in a potting material whereby said potted coil is characterized by a first coefficient of thermal expansion in the radial direction and by a second coefficient of thermal expansion in the axial direction;

c) said spool comprising a substantially cylindrical central hub and a substantially-planar flange located at at least one end thereof;

d) said at least one flange being of a first material having a coefficient of thermal expansion that approximates said first coefficient of thermal expansion; and

e) said hub comprising a second material so that the coefficient of thermal expansion of said hub approximates said second coefficient of thermal expansion.

5,486,923

APPARATUS FOR DETECTING RELATIVE MOVEMENT WHEREIN A DETECTING MEANS IS POSITIONED IN THE REGION OF NATURAL INTERFERENCE

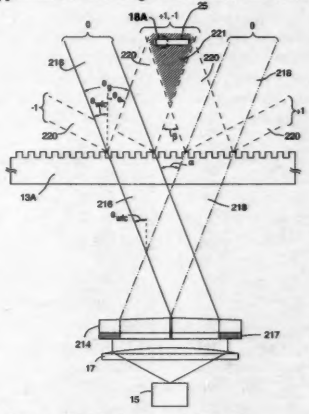
Donald K. Mitchell, Newton, and William G. Thorburn, Whitinsville, both of Mass., assignors to MicroE, Needham Heights, Mass.

Continuation of Ser. No. 250,666, May 27, 1994, abandoned, which is a continuation-in-part of Ser. No. 878,494, May 5, 1992, abandoned. This application Feb. 24, 1995, Ser. No. 394,224

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—356 **40 Claims**

1. An apparatus for detecting relative movement comprising



a diffraction grating relatively movable with respect to a source and having a period P and a characteristic which diffracts light at a preselected wavelength λ into positive and negative first orders which interfere with one another in a region of natural interference adjacent the diffraction grating;

means for illuminating with first and second beams of light of wavelength λ a region of said diffraction grating;

a periodic detector having a sensing plane positioned within the region of natural interference of the diffraction grating between positive and negative first orders from the first and second beams of light;

wherein the periodic detector has a period which is a function of the preselected wavelength λ and the period P of the diffraction grating, wherein the periodic detector provides an output signal in response to light incident thereon, whereby the periodic detector responds principally to interference at said sensing plane between the positive and negative first orders diffracted from said diffraction grating.

5,486,924

METHOD AND APPARATUS FOR MEASUREMENT OF ROUGHNESS AND HARDNESS OF A SURFACE

Christopher Lacey, San Diego, Calif., assignor to Phase Metrics, San Diego, Calif.

Division of Ser. No. 781,820, Oct. 23, 1991, Pat. No. 5,280,340. This application Dec. 22, 1993, Ser. No. 172,471

Int. Cl.[6] G01B *9/02*

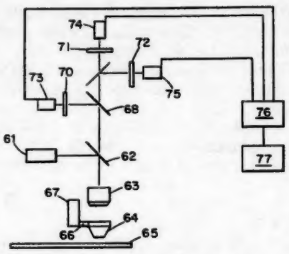
U.S. Cl. 356—357 **9 Claims**

1. A method for simultaneously measuring roughness and hardness of a surface which comprises:

splitting light having a plurality of wavelengths λ into a first portion and a second portion;

directing said first portion along a light path toward an interface between a transparent probe and said surface at a first location of said surface;

attaching a load cell to said probe;



reflecting said first portion from said interface;

combining the reflected said first portion and said second portion to generate fringe patterns;

storing maximum and minimum intensity of said fringe patterns for each wavelength λ;

calculating spacing using said maximum and minimum intensity;

moving said probe toward said surface while continuously generating said fringe patterns and storing their maximum and minimum intensity; and

detecting a contact load between said probe and said surface while said probe deforms said surface.

5,486,925

DISPLACEMENT SENSING APPARATUS FOR A MOVABLE MEMBER

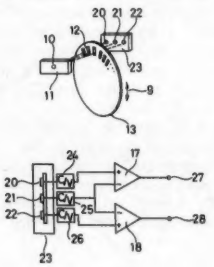
Masashi Sano, and Tadayoshi Ogawa, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Jun. 1, 1993, Ser. No. 69,772

Int. Cl.[6] G01B *11/14;11/02*

U.S. Cl. 356—373 **5 Claims**

1. A displacement sensing apparatus for a movable member,



comprising:

a light emitting device and a light receiving device arranged to be opposite to each other with a predetermined space therebetween;

a movable member arranged between the light emitting device and the light receiving device to be movable in a direction perpendicular to an optical axis of a light beam emitted from the light emitting device and incident on the light receiving device; and

a plurality of slits formed in the movable member for allowing light emitted from the light emitting device to pass therethrough when the slits come to a position of the optical axis,

wherein at least three light receiving devices are provided, and wherein first and second comparators are provided which generate pulsed first and second outputs by using an output of one of the three light receiving devices as a reference value and comparing outputs of the other two light receiving devices with the one of the three light receiving devices used as the reference value.

5,486,926

METHOD AND A DEVICE FOR A HIGHLY ACCURATE MEASUREMENT OF DISTANCES, WHICH MAY CHANGE, IF A NECESSARY, BETWEEN AN OBJECT, FOR EXAMPLE A CLAMP WORKPIECE, AND A POINT OF REFERENCE

Gerd Hausler, Erlangen, Germany, assignor to MAHO Aktiengesellschaft, Germany

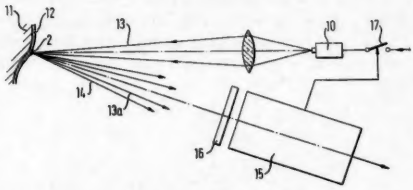
Filed Mar. 1, 1993, Ser. No. 22,652

Claims priority, application Germany, Mar. 2, 1992, 42 06 499.6

Int. Cl.[6] G01B *11/14;11/00*

U.S. Cl. 356—375 **17 Claims**

1. A method for distance measurement between a subject and a



point of reference said method comprising the steps of:

exposing said subject at a point of light, to electromagnetic radiation from a radiation source to excite said subject with said electromagnetic radiation to emit spatially incoherent radiation;

finding a distance between said subject and said point of reference by:

capturing radiation coming from said point of light with a measuring head;

separating said spatially incoherent radiation emitted at said subject from said radiation coming from said point of light; and

determining said distance between said subject and said point of reference using said spatially incoherent radiation emitted by said subject.

5,486,927

DIGITAL IMAGE FORMING APPARATUS USING SUBDIVIDED PIXELS

Noboru Koizumi; Satoshi Haneda; Yoshiyuki Ichihara; Takashi Hasebe, and Tetsuya Niitsuma, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 10, 1992, Ser. No. 927,746

Claims priority, application Japan, Aug. 19, 1991, 3-206883; Aug. 26, 1991, 3-213678; Sep. 10, 1991, 3-230485; Jan. 15, 1991, 3-266519

Int. Cl.[6] H04N *1/387;1/29;1/40;* **G01D** *15/14*

U.S. Cl. 358—298 **11 Claims**

1. A method of forming an image in a form of two-dimensional image lines of pixels, comprising:

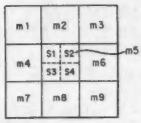
processing image signals of neighboring pixels which are around and surround a target pixel to obtain a density distribution around the target pixel, wherein the neighboring pixels comprise pixels on three image lines including:

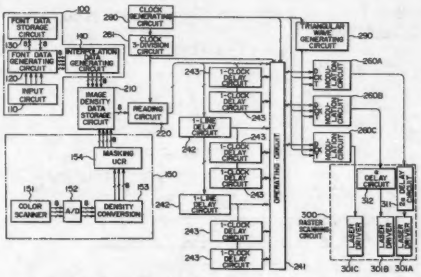
a current image line having the target pixel therein; an image line preceding the current image line; and an image line succeeding the current image line;

dividing the target pixel into plural sub-pixels to form a matrix that includes n rows×m columns, wherein each sub-pixel is smaller in size than the target pixel;

obtaining a density ratio for each sub-pixel in the target pixel on a basis of the density distribution of the neighboring pixels around the target pixel;

determining a density of one of the sub-pixels by multiplying a density of the target pixel, by a constant P and by the density ratio obtained for the one of the sub-pixels, whereby a sub-





density distribution of a plurality of sub-pixels in the target pixel is obtained; and

forming a dot image for the target pixel on a basis of the sub-density distribution of the plurality of sub-pixels in the target pixel.

5,486,928

METHOD FOR MANUFACTUING A STAMP TO EMBOSS WIRE CLOTHS IN ORDER TO MAKE WATERMARKS AND EQUIPMENT TO IMPLEMENT THIS METHOD

Pierre Doublet, Jouy sur Morin; Claude Passebecq, Paris, and Etienne Bigot, Jouy sur Morin, all of, France, assignors to Arjo Wiggins S.A., Paris, France

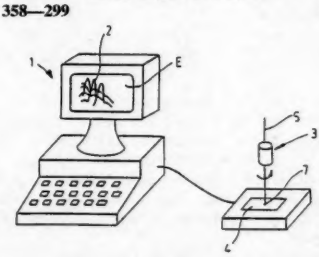
PCT No. PCT/FR91/00202, § 371 Date Sep. 14, 1992, § 102(e) Date Sep. 14, 1992, PCT Pub. No. WO91/14217, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 12, 1991, Ser. No. 934,452

Claims priority, application France, Mar. 13, 1990, 90 03415

Int. Cl.[6] H04N *1/21;1/23*

U.S. Cl. 358—299 **21 Claims**



1. A method for manufacturing an embossing stamp used to emboss wire cloths in the manufacture of watermarked paper, wherein values of an image are sensed and digitized, said values including positions of image dots and gray levels of these dots, wherein the improvement comprises the steps of associating a continuous three-dimensional surface with the digital image values and plotting elevation contour lines of this continuous surface, processing the elevation contour lines and deriving continuous control values for a path of an engraving tool, said path being continuous, and engraving the stamp in an automated manner.

5,486,929

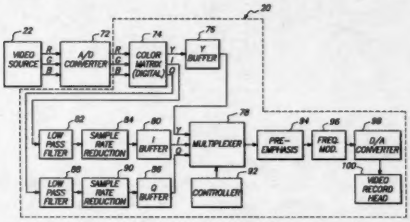
TIME DIVISION MULTIPLEXED VIDEO RECORDING AND PLAYBACK SYSTEM

Lawrence F. Heyl, Mountain View, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 3, 1993, Ser. No. 116,313

Int. Cl.[6] H04N *9/79*

U.S. Cl. 358—320 **38 Claims**



1. A system for recording component television signals onto an analog video tape, comprising:

means for generating a digital luminance signal, a first digital chrominance signal, and a second digital chrominance signal, said digital luminance signal, said first digital chrominance signal, and said second digital chrominance signal compatible with a predetermined composite television signal standard and having a first sampling rate;

first sample rate reduction means, coupled to said first digital chrominance signal for generating therefrom a first sample rate reduced digital chrominance signal having a second sampling rate;

second sample rate reduction means coupled to said second digital chrominance signal for generating therefrom a second sample rate reduced digital chrominance signal having a third sampling rate;

multiplexer means, coupled to said digital luminance signal, said first sample rate reduced digital chrominance signal, and said second sample rate reduced digital chrominance signal, for generating therefrom a digital time division multiplexed video signal;

digital signal processing means, coupled to said digital time division multiplexed video signal, for generating therefrom a digital frequency modulated time division multiplexed video signal; and

digital to analog converter means for converting said digital frequency modulated time division multiplexed video signal into an analog frequency modulated time division multiplexed video signal capable of being recorded onto said analog video tape;

said system having a bandwidth capacity no greater than necessary for common consumer VCR standards.

5,486,930

APPARATUS FOR RECORDING AND REPRODUCING A VIDEO SIGNAL USING A DIGITAL VIDEO CASSETTE RECORDER

Akira Iketani, Higashiosaka; Susumu Ikeda, Kobe; Susumu Yamaguchi, Nishinomiya; Chiyoko Matsumi, Suita, and Takayasu Yoshida, Toyono, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 16, 1993, Ser. No. 78,572

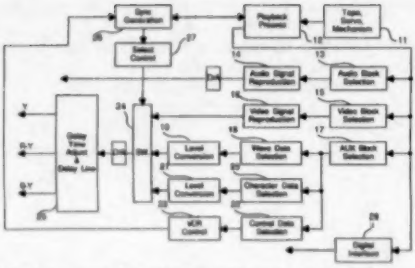
Claims priority, application Japan, Jun. 16, 1992, 4-156355; Nov. 27, 1992, 4-318240

Int. Cl.[6] H04N *5/76;* **G11B** *5/00;5/09*

U.S. Cl. 358—335 **8 Claims**

6. An apparatus for reproducing a non-character digital video signal containing a predetermined number of different quantized wave form data having m-bits, said apparatus comprising:

reproducing processing means for reproducing said non-character digital video signal from a recording medium;



selecting means for selecting said predetermined number of different quantized wave form data;

counter conversion means for converting said predetermined number of different quantized wave form data to a non-character digital wave form data of n-bits, said non-character digital wave form data having a predetermined number of different levels; and

adder means for adding said non-character digital wave form data in a vertical blanking period of said non-character digital video signal.

5,486,931

DIGITAL VIDEO SIGNAL RECORDING AND REPRODUCING METHOD AND APPARATUS THEREOF

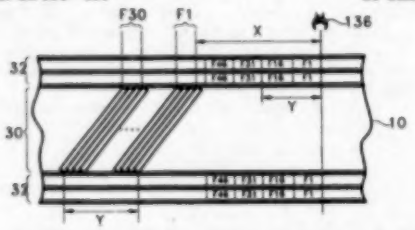
Jung-kuk Kim, Daegu, and Kwang-ho Moon, Seoul, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jul. 14, 1993, Ser. No. 91,128

Claims priority, application Rep. of Korea, Jul. 14, 1992, 92-12524

Int. Cl.[6] H04N *5/76*

U.S. Cl. 388—335 **20 Claims**



1. A digital video recording and reproducing method comprising the steps of:

reserving a first region of a magnetic tape;

helically scanning said first region of the magnetic tape while the magnetic tape is running at a normal speed to record a digital data train on a plurality of sloped tacks;

simultaneously with said scanning step recording single frame data at an interval of N pictures on a second region of the magnetic tape, the second region being different from the first region;

reproducing the data recorded only on the first region during a normal reproduction; and

reproducing the data recorded on the second region while the magnetic tape runs at an N-times speed for a variable speed reproduction.

5,486,932

DOCUMENT SCANNER AND VACUUM TABLE THEREFOR

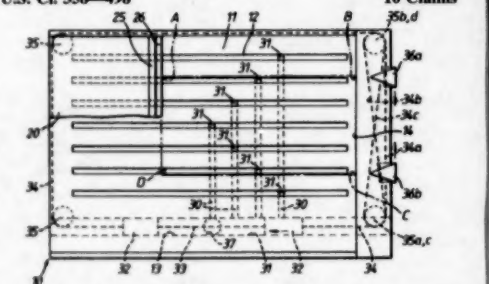
Jacques V. Leonard, Antwerpen, Belgium, assignor to Agfa-Gevaert N. V., Mortsel, Belgium

Continuation of Ser. No. 102,240, Aug. 5, 1993. This application Nov. 2, 1994, Ser. No. 333,999

Claims priority, application European Pat. Off., Aug. 11, 1992, 92202459

Int. Cl.[6] H04N *1/04*

U.S. Cl. 358—498 **10 Claims**



1. In a vacuum table for holding a generally rectangular flexible sheet of variable dimensions in position, which table comprises a supporting surface having a length and width for supporting said flexible sheet thereon with one axis of such sheet parallel with the length of said surface, a vacuum source, and connected to said source a vacuum distribution line which, in the absence of such a sheet on said surface, is in gas flow communication with the ambient atmosphere over a generally rectangular vacuum zone on the table surface via openings distributed over that surface to define said vacuum zone, in combination, the improvement wherein said openings are arranged in rows extending generally lengthwise of said surface along generally parallel lines spaced apart widthwise of said supporting surface, said rows of opening having substantially the same length, and said table further comprises means for obstructing said rows of openings for gas flow communication therethrough over an adjustable generally common end portion of the length thereof whereby the length of the vacuum zone may be matched to the dimension of said flexible sheet parallel to the length of said surface, and control means independent of the obstructing means for disconnecting from said vacuum distribution line selected ones of said lengthwise extending rows of openings whereby the dimension of the vacuum zone parallel to the surface width may be matched to the corresponding dimension of such flexible sheet.

5,486,933

MONOCHROMATIC-LIGHT REPRODUCTION TYPE HOLOGRAM, AND METHOD AND APPARATUS FOR ITS IMAGE REPRODUCTION

Naoaki Shindo; Takehide Kita; Nagahisa Matsudaira; Akihiko Kobayashi; Yoshiaki Tada; Takashi Sato, and Atsushi Sato, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1993, Ser. No. 170,910

Claims priority, application Japan, Dec. 28, 1992, 4-347733; Mar. 29, 1993, 5-070560

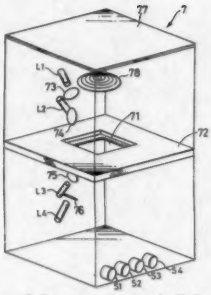
Int. Cl.[6] G02B *5/32;* **G03H** *1/28*

U.S. Cl. 359—2 **1 Claim**

1. An apparatus for reproducing a hologram image from a light transmission monochromatic-light reproduction type hologram, comprising;

a holding means for setting a light transmission monochromatic-light reproduction type hologram recorded article at a given position;

a plurality of upper-side monochromatic light irradiation means provided above the holding means and by which a hologram



recorded area of the monochromatic-light reproduction type hologram recorded article set on the given position is irradiated with monochromatic light rays at given angles to reproduce by reflected diffracted light a hologram image having a first identity information function;

a plurality of lower-side monochromatic light irradiation means provided below the holding means and by which a hologram recorded area of the monochromatic-light reproduction type hologram recorded article set on the given position is irradiated with monochromatic light rays at given angles to reproduce by transmitted diffracted light a hologram image having a second identity information function;

said hologram recorded area being an area in which a plurality of hologram images different from each other in the directionality of interference fringes are recorded, and being irradiated with said monochromatic light rays at given angles corresponding to the directionality of interference fringes of the recorded respective hologram images; and

an image forming screen on which the hologram image reproduced by the reflected diffracted light and the hologram image reproduced by the transmitted diffracted light are synthesized to reproduce a single information pattern having a third identity information function different from said first identity information function and said second identity information function and substantially infeasible for a dead copy.

5,486,934

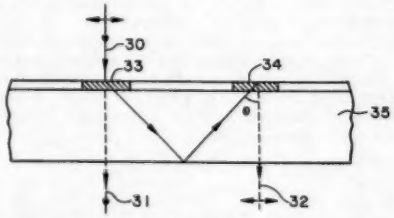
POLARIZATION BEAMSPLITTER WITH A SUBSTRATE-MODE HOLOGRAPHIC STRUCTURE

Yang-Tung Huang, Hsinchu, Taiwan, Prov. of China, assignor to National Science Council, Taipei, Taiwan, Prov. of China

Filed Feb. 17, 1994, Ser. No. 198,176

Int. Cl.[6] G02B *5/32;5/30;5/28;5/18*

U.S. Cl. 359—15 **7 Claims**



1. A polarization beamsplitter for performing the function of polarization selection, comprising:

an optically transmissible substrate;

an input coupling grating formed on a first side of said optically transmissible substrate for separating an input beam, having an input beam wavelength, into an direction-unchanged linear polarization beam and a first diffracted linear polarization beam, wherein the polarization of said direction-unchanged linear polarization beam is perpendicular to the polarization of said diffracted linear polarization beam, said direction-unchanged linear polarization beam and said first diffracted linear polarization beam having a first diffraction angle therebetween, said input coupling grating having an input coupling grating film thickness and an input coupling grating index modulation; and

an output coupling grating formed on said first side of said optically transmissible substrate for diffracting said first diffracted linear polarization beam to become a secondly diffracted linear polarization beam after said first diffracted linear polarization beam has propagated through said optically transmissible substrate followed by internal reflecting, said secondly diffracted linear polarization beam and said first diffracted linear polarization beam after said internal reflecting having a second diffraction angle therebetween, said output coupling grating having an output grating film thickness and an output grating index modulation, wherein the input coupling grating index modulation, the output coupling grating index modulation, the input coupling grating film thickness, the output coupling grating film thickness and the input beam wavelength are selected such that said first diffraction angle and said second diffraction angle are selected from the group consisting of 48.2°, 41.1° and 60.0°, and said secondly diffracted linear polarization beam being transmitted out of said optically transmissible substrate on an opposite side of said first side of said optically transmissible substrate with a direction parallel to said direction-unchanged linear polarization beam.

5,486,935

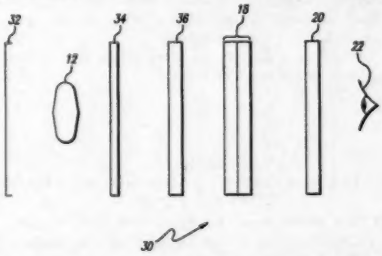
HIGH EFFICIENCY CHIRAL NEMATIC LIQUID CRYSTAL REAR POLARIZER FOR LIQUID CRYSTAL DISPLAYS HAVING A NOTCH POLARIZATION BANDWIDTH OF 100 NM TO 250 NM

Michael H. Kalmanash, Los Altos, Calif., assignor to Kaiser Aerospace and Electronics Corporation, Foster City, Calif.

Filed Jun. 29, 1993, Ser. No. 84,634

Int. Cl.[6] G02F *1/13;1/1335*

U.S. Cl. 359—37 **14 Claims**



1. An assembly for a direct view apparatus comprising:

a light source;

circularly polarizing means in the optical path in a first, forward direction, said circularly polarizing means including a polymer chiral nematic liquid crystal, said polymer chiral nematic liquid crystal having a notch polarization bandwidth sufficient to allow transmission of circularly polarized light within a 100 nm to 250 nm band selected from the range of visible light;

rear reflecting means adjacent said light source in a second, rearward direction;

converting means for converting circularly polarized radiation to linearly polarized radiation directly adjacent said circular polarizing means;

display means directly adjacent said converting means for converting linearly polarized light to a direct view display; and

polarization means directly adjacent said display means for absorbing radiation not contributing to the direct view display image.

5,486,936
OPTICALLY ADDRESSED SPATIAL LIGHT MODULATOR

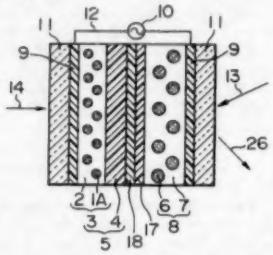
Hideo Fujikake; Kuniharu Takizawa, both of Tokyo; Juichi Hirose, and Tatsushi Kobayashi, both of Shizuoka, all of, Japan, assignors to Tomoegawa Paper Co., Ltd., and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Mar. 22, 1993, Ser. No. 35,206

Claims priority, application Japan, Mar. 25, 1992, 4-097348; Mar. 25, 1992, 4-097446

Int. Cl.[6] G02F *1/13;1/135;1/03;* **G03G** *15/02*

U.S. Cl. 359—51 **11 Claims**



1. An optically addressed spatial light modulator comprising a photoconductive layer, a liquid crystal layer, and transparent electrodes characterized in that:

the photoconductive layer is a multilayer-type photoconductive layer comprising a charger carrier generation layer which is made of one kind or more than two kinds of photoconductive material, and a charge carrier transport layer which is made of a carrier material having a large mobility;

the liquid crystal layer is a liquid crystal/resin composite layer comprising a nematic liquid crystal, cholesteric liquid crystal, smetic liquid crystal, or a blended liquid crystal, and a transparent resin having an equivalent refractive index to ordinary refractive index of the liquid crystal, where either the resin is dispersed into the liquid crystal, or the liquid crystal is dispersed into the resin;

said charge carrier transport layer is located on the charge carrier generation layer on the side where the liquid crystal/resin composite layer is located; and

the transparent electrodes are fixed to the two diametrically opposite side of these layers.

5,486,937
LATEX CONTAINMENT MEANS FOR A LIQUID CRYSTAL WINDOW

Yuichi Yano, Itami; Naoki Kinugasa, and Akio Takigawa, both of Nishinomiya, all of, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 958,298, Oct. 8, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 262,345

Claims priority, application Japan, Jan. 18, 1991, 3-270934

Int. Cl.[6] G02F *1/13*

U.S. Cl. 359—51 **14 Claims**

1. A light modulating window comprising:

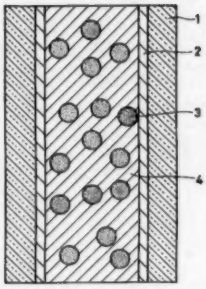
a pair of transparent substrates,

transparent conductive films respectively disposed on the inner surfaces of said transparent substrates, and

a containment means containing a liquid crystal material in gaps interposed between said transparent conductive films,

wherein said containment means includes a latex, and

wherein a difference between an extraordinary index (n_e) and an ordinary index (n_o) of said liquid crystal material is less than 0.23, and an average refractive index (n_a) of said liquid crystal material, a refractive index (n_b) of said containment means, a volume ratio (V) of said liquid crystal material to the total volume of said liquid crystal material and said containment means, an average diameter (D) of each of said gaps in



terms of a true spherical body having the same volume and a distance (t) between said transparent conductive films satisfy the following equation,

$$|n_a - n_b| \times (6 \times V/D) \times t \geqq .2.$$

5,486,938
ANTI-DAZZLE SYSTEM FOR VEHICLES

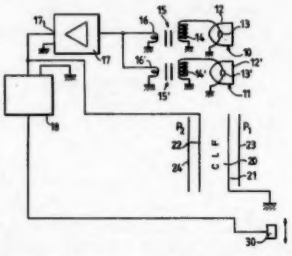
Pierre Aigrain, Paris, France, assignor to Thomson-CSF, Puteaux, France

Continuation of Ser. No. 94,025, Jul. 29, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,754

Claims priority, application France, Feb. 19, 1991, 91 01929

Int. Cl.[6] G02F *1/135;1/13*

U.S. Cl. 359—72 **11 Claims**



1. An anti-dazzle system for a vehicle, comprising:

headlamp control means for controlling at least one headlamp of said vehicle whereby said headlamp outputs periodic light pulses having a duration which is short with regard to their period;

a screen arranged in front of a driver of said vehicle having a variable light transmission coefficient;

means responsive to said period pulses to vary the transmission coefficient of said screen whereby said screen is transparent only during the duration of said light pulses and wherein said transmission coefficient is substantially lower; but high enough to allow said driver to see headlamps of oncoming vehicles between said pulses.

5,486,939
THIN-FILM STRUCTURE WITH INSULATING AND SMOOTHING LAYERS BETWEEN CROSSING CONDUCTIVE LINES

Ronald T. Fulks, Mountain View, Calif., assignor to Xerox Corporation, Stamford, Conn.

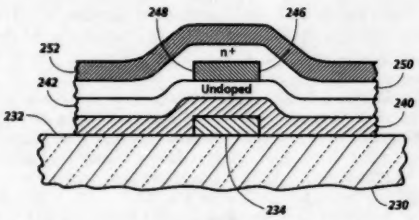
Filed Apr. 28, 1994, Ser. No. 284,885

Int. Cl.[6] G02F *1/1333;* **H01L** *23/48*

U.S. Cl. 359—74 **25 Claims**

1. A product comprising:

a substrate that has a surface; and



a thin-film structure formed at the surface of the substrate; the thin-film structure comprising:

first and second conductive lines;

first and second leads for connecting components to be second conductive line at first and second connecting points; the second conductive line extending between the first and second connecting points; the second conductive line crossing over the first conductive line in a crossover region between the first and second connecting points so that the first conductive line is between the second conductive line and the surface of the substrate in the crossover region; the first conductive line having an edge in the crossover region;

a first insulating layer between the second conductive line and the surface and the substrate; the first insulating layer being between the first and second conductive lines in the crossover region so that the first insulating layer covers the first conductive line;

a second insulating layer between the first insulating layer and the second conductive line in the crossover region; the second insulating layer being sufficiently thick that signals in the first and second conductive lines are isolated from each other and do not couple; the second insulating layer having an edge under the second conductive line between the first and second connecting points; and

a smoothing layer under the second conductive line between the first and second connecting points; the smoothing layer being between the second insulating layer and the second conductive line in the crossover region; the smoothing layer having an outer surface shaped so that the second conductive line is continuously formed over the edge of the first conductive line and over the edge of the second insulating layer and so that the second conductive line electrically connects the first and second leads.

5,486,940

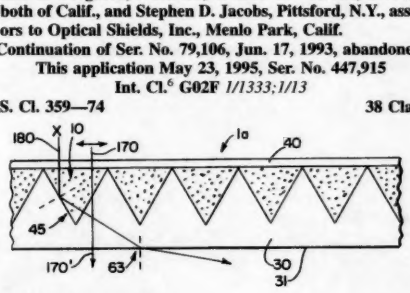
LIQUID CRYSTAL LIGHT POLARIZER AND METHOD

James L. Fergason, Atherton; Arthur L. Berman, San Jose, both of Calif., and Stephen D. Jacobs, Pittsford, N.Y., assignors to Optical Shields, Inc., Menlo Park, Calif.

Continuation of Ser. No. 79,106, Jun. 17, 1993, abandoned. This application May 23, 1995, Ser. No. 447,915

Int. Cl.[6] G02F *1/1333;1/13*

U.S. Cl. 359—74 **38 Claims**



1. A polarizer, comprising

liquid crystal material, and

surface means for cooperating with said liquid crystal material to control polarization of light on said polarizer by refraction or total internal reflection of one polarization component of said light while transmitting the other polarization component substantially without refraction or total internal reflection, said surface means including plural grooves in cooperative relationship with said liquid crystal material.

5,486,941

FINE SPHERE, A SPHERICAL SPACER FOR A LIQUID CRYSTAL DISPLAY ELEMENT AND A LIQUID DISPLAY ELEMENT USING THE SAME

Kazuo Saiuchi, Otsu; Minoru Kohara, Otokuni; Kunikazu Yamada, Kurita, and Kazuhiko Kanki, Uji, all of, Japan, assignors to Sekisui Fine Chemical Co., Ltd., Osaka, Japan

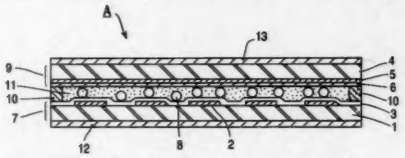
PCT No. PCT/JP91/01285, § 371 Date May 28, 1992, § 102(e) Date May 28, 1992, PCT Pub. No. WO92/06402, PCT Pub. Date Apr. 16, 1992

PCT Filed Sep. 27, 1991, Ser. No. 859,408

Claims priority, application Japan, Sep. 29, 1990, 2-261728; May 9, 1991, 3-104298; May 9, 1991, 3-104299; May 9, 1991, 3-104300

Int. Cl.[6] G02F *1/1339;1/1345;* **G09F** *9/35*

U.S. Cl. 359—81 **14 Claims**



1. A fine sphere having: a K-value defined as

$$K = (3/\sqrt{2}) \cdot F \cdot S^{-3/2} \cdot R^{-1/2}$$

(wherein F and S represent a load value (kgf) and a compression displacement (mm) at 10% compression deformation of said fine sphere, respectively, and R represents a radius (mm) of said fine sphere) which is in the range of 250 kgf/mm^2 to 700 kgf/mm^2 at 20° C.; and a recovery factor after the compression deformation which is in the range of 30% to 80% at 20° C.,

wherein said fine sphere is made of divinylbenzene-tetramethylolmethane tetraacrylate copolymer.

5,486,942

METHOD OF MOUNTING A LIQUID CRYSTAL DISPLAY EMPLOYING SHOCK MOUNTS WITH RECEIVING SLOTS

Shinpei Ichikawa, Cupertino; Paul R. hamerton-Kelly, Palo Alto, and Noah L. Anglin, San Jose, all of Calif., assignors to Fujitsu Personal Systems, Inc., Santa Clara, Calif.

Division of Ser. No. 809,536, Jan. 29, 1992, Pat. No. 5,363,227, which is a continuation-in-part of Ser. No. 359,191, May 31, 1989, Pat. No. 5,002,368. This application Jul. 28, 1994, Ser. No. 283,112

Int. Cl.[6] G02F *1/1335;1/1333*

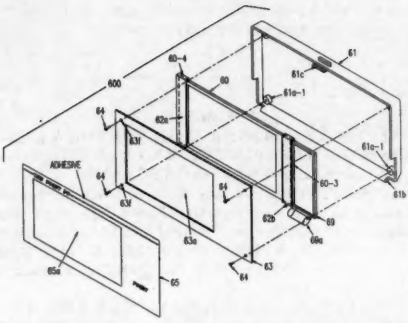
U.S. Cl. 359—83 **8 Claims**

1. A method of mounting a liquid crystal display (LCD) assembly having first and second opposing edges, said method comprising the steps of:

mounting first and second resilient shock mounts on an associated one of the opposing edges of the LCD assembly by positioning a slot in each shock mount over each said associated edge of the LCD assembly, each said slot having a pair of closed ends which secure said associated edge, thereby retaining said edges within said associated slots;

installing the LCD assembly and said mounted shock mounts into a housing;

placing a horizontal plate into said housing over the LCD assembly and said shock mounts, said horizontal plate covering said shock mounts; and



joining together said horizontal plate with said housing with said shock mounts interposed between said housing and said horizontal plate to fixedly position the LCD assembly and shock mounts with respect to said housing, wherein the LCD assembly is suspended away from said horizontal plate and said housing.

5,486,943

PHOTONIC FREQUENCY DIVISION MULTIPLEXED FIFO BUFFER

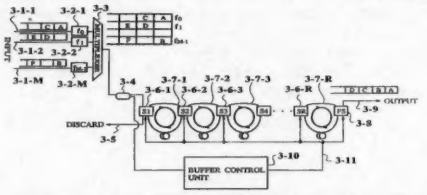
Koji Sasayama, Saitamaken, and Keishi Habara, Tokyo, Japan, assignors to Nippon Telegraph and Telephone Corp., Tokyo, Japan

Filed Jul. 14, 1994, Ser. No. 275,121

Claims priority, application Japan, Jul. 14, 1993, 5-174507; May 24, 1994, 5-109508

Int. Cl.[6] **H04J** *14/00;4/00;14/08*

U.S. Cl. 359—123 **14 Claims**



1. A photonic frequency division multiplexed FIFO buffer for inputting a plurality of optical signals on a plurality of time division multiplexed input highways as frequency division multiplexed input optical signals and outputting output optical signals at timeslots on a time division multiplexed output highway, comprising:

splitter means for splitting the input optical signals into two;

a plurality of loop shaped optical waveguide delay lines for storing the input optical signals;

a plurality of 2×2 optical switch means for connecting the loop shaped optical waveguide delay lines in series with one output of the splitter means, and selectively transferring the input optical signals among the loop shaped optical waveguide delay lines;

1×2 frequency channel selector means, connected at a last stage of the loop shaped optical waveguide delay lines, for selectively outputting optical signals in specific frequency channels among the input optical signals stored by the last stage of the loop shaped optical waveguide delay lines as the output optical signals to the output highway; and

buffer control means for generating a control signal for controlling a selective transferring by each of the 2×2 optical switch means and a selective outputting by the 1×2 frequency channel selector means according to another output of the splitter means.

5,486,944

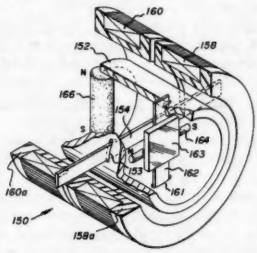
SCANNER MODULE FOR SYMBOL SCANNING SYSTEM

Simon Bard, Stony Brook; Askold Strat, Patchogue, and Paul Dvorkis, Stony Brook, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Continuation of Ser. No. 61,070, May 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 884,734, May 19, 1992, which is a continuation-in-part of Ser. No. 868,401, Apr. 14, 1992, Pat. No. 5,280,165, which is a division of Ser. No. 520,464, May 8, 1990, Pat. No. 5,168,149, which is a continuation-in-part of Ser. No. 428,770, Oct. 30, 1989, Pat. No. 5,099,110. This application Sep. 6, 1994, Ser. No. 302,071

Int. Cl.[6] **G06K** *7/10;* **G02B** *26/10*

U.S. Cl. 359—198 **4 Claims**



1. An optical scanner module for directing a light beam in a pattern to scan an encoded symbol, the scanner module comprising, in combination:

an optical element for directing the light beam;

a first permanent magnet for establishing a first magnetic field having a first magnetic axis;

a first elongated flex element, having opposed ends, for mounting said optical element and said first permanent magnet in back-to-back relation at a location intermediate said opposed ends;

means for mounting said opposed ends of said first flex element;

a second permanent magnet mounted by said mounting means and establishing a second magnetic field having a second magnetic axis;

a second elongated flex element, having fixedly mounted opposed ends, for mounting said mounting means at a location intermediate said opposed ends; and

electromagnetic coil means for receiving an AC drive current to establish a third magnetic field having a third magnetic axis oriented in orthogonal relation to said first and second magnetic axes, whereby interaction of the first, second and third magnetic fields generates oscillatory motions of said optical element in a first direction about a first axis defined by said first flex element and in a second direction about a second axis defined by said second flex element to produce bidirectional scanning movement of the light beam.

5,486,945

OPTICS FOR PASSIVE FACET TRACKING

Ellis D. Harris, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1994, Ser. No. 360,480

Int. Cl.[6] **G02B** *26/08*

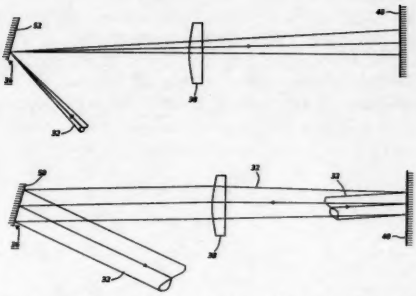
U.S. Cl. 359—216 **8 Claims**

1. A passive facet tracking system comprising:

A) a dual mirror rotating polygon having an axis of rotation and two facets, one facet located above the other in a direction which is along the axis of rotation, one of said facets being a flat facet and the other of said facets being a convex facet,

B) a retro-reflector which has no power in a sagittal plane,

C) a lens means,



D) said polygon, said lens means and said retro-reflector being so constructed and arranged relative to each other for said polygon convex facet to reflect a beam along a first path through said lens means to said retro-reflector, said retro-reflector receiving the beam reflected from said polygon convex facet and reflecting the beam through a second path through said lens means to said polygon flat facet, and said polygon flat facet reflecting the beam received from said retroreflector in a post scan direction, and

E) said lens means being so constructed to partially collimate the beam, which has been focussed on said polygon convex facet, in a tangential plane after reflection from said polygon convex facet along the first path as the beam passes through said lens means and to complete collimation of the beam in the tangential plane after reflection from said retro-reflector along the second path as it passes through said lens means so that the beam is collimated in the tangential plane when it arrives at said polygon flat facet and to partially converge the beam, which has been collimated at said polygon convex facet, in a sagittal plane after reflection from said polygon convex facet along the first path as the beam passes through said lens means and to complete convergence of the beam in the sagittal plane after reflection from said retro-reflector along the second path as it passes through said lens means so that the beam is focussed in the sagittal plane when it arrives at said polygon flat facet.

5,486,946

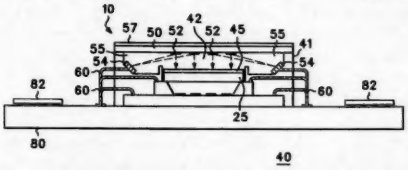
INTEGRATED ELECTRO-OPTIC PACKAGE FOR REFLECTIVE SPATIAL LIGHT MODULATORS

Karen E. Jachimowicz, Laveen; George R. Kelly, Gilbert, and Michael S. Lebby, Apache Junction, all of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Dec. 21, 1994, Ser. No. 360,505

Int. Cl.[6] G02F *1/03*

U.S. Cl. 359—263 **26 Claims**



1. An integrated electro-optic package for reflective spatial light modulators comprising:

an array of reflective spatial light modulator pixels formed on a substrate with each pixel including a control circuit formed in the substrate, each control circuit including control terminals adjacent an outer edge of the substrate, a mirror positioned on the substrate in overlying relationship to the control circuit, and spatial light modulator material positioned in overlying relationship to the mirror so that light passing through the spatial light modulator material is reflected back through the spatial light modulator material;

a light polarizing layer positioned in overlying relationship to the array of reflective spatial light modulator pixels;

a housing with an internal cavity formed to receive the array of reflective spatial light modulator pixels and the light polarizing layer therein, the housing defining an opening generally parallel with and spaced from the light polarizing layer and including an optical layer positioned in the opening;

an at least partially reflective member affixed to the optical layer;

a light source mounted in the housing so that light emanating from the light source is directed onto the reflective member and is reflected substantially uniformly onto the light polarizing layer; and

the optical layer including a diffuser forming an image plane for reflected light from the array of reflective spatial light modulator pixels.

5,486,947

OPTICAL FIBER FOR OPTICAL AMPLIFIER

Yasutake Ohishi; Terutoshi Kanamori; Yoshiki Nishida; Atsushi Mori, and Shoichi Sudo, all of Mito, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

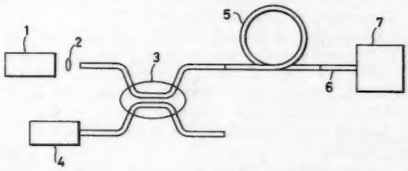
Division of Ser. No. 934,242, Aug. 25, 1992, Pat. No. 5,351,335. This application May 6, 1994, Ser. No. 238,936

Claims priority, application Japan, Aug. 26, 1991, 3-213568; Mar. 30, 1992, 4-74394; Apr. 21, 1992, 4-101424; Jun. 15, 1992, 4-155386; Jun. 16, 1992, 4-157058

Int. Cl.[6] H01S *3/17*

U.S. Cl. 359—341 **46 Claims**

1. An optical fiber amplifier comprising:



a pump light source;

a light focusing means for focusing the pump light from said pump light source;

a signal source for generating a signal light;

a photocoupling means which couples the pump light with the signal light to give a coupled light; and

an optical fiber having a core and a cladding, said optical fiber receiving the coupled light from said photocoupling means and amplifying the coupled light,

wherein said optical fiber is a fluoride glass optical fiber containing rare earth metal ions in a core glass, a relative refractive index difference between the core and the cladding being at least 1.4%, and

wherein said core glass contains PbF_2 in a proportion which is not greater than 25 mol % based on the total composition of said core glass.

5,486,948

STEREO IMAGE FORMING APPARATUS HAVING A LIGHT DEFLECTION MEMBER IN EACH OPTICAL PATH

Hitoshi Imai, Yokohama; Muneharu Sugiura, Tokyo, and Katsutoshi Hoashi, Yokohama, all of, Japan, assignors to Canon Hanbai Kabushiki Kaisha; Canon Kabushiki Kaisha, and Ikegami Tsushinki Co., Ltd., all of Tokyo, Japan

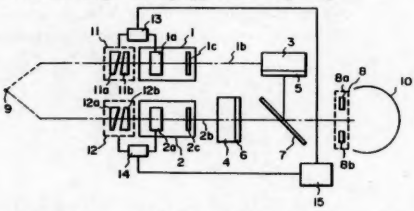
Continuation of Ser. No. 34,173, Mar. 18, 1993, abandoned, which is a continuation of Ser. No. 701,334, May 9, 1991, abandoned, which is a continuation of Ser. No. 497,352, Mar. 22, 1990, abandoned. This application May 16, 1994, Ser. No. 243,515

Claims priority, application Japan, Mar. 24, 1989, 1-72459

Int. Cl.[6] G02B *27/22*

U.S. Cl. 359—462 **33 Claims**

1. A stereo image forming apparatus, comprising:



a photographing optical system having two optically independent optical axes;

a focusing operation unit for outputting a focus signal corresponding to a focus condition of said photographing optical system;

a light deflection member located on each said optical axis for deflecting light; and

adjusting means for adjusting a light deflection condition of each said light deflection member in response to the focus signal output by said focusing operation unit to cause two deflected light paths to cross each other.

5,486,949

BIREFRINGENT INTERFERENCE POLARIZER

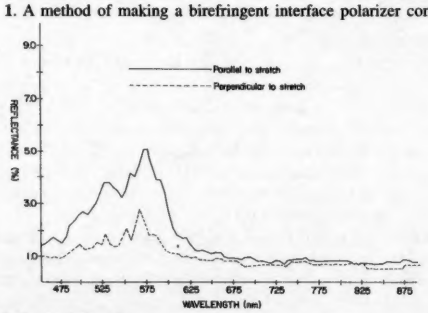
Walter J. Schrenk; John A. Wheatley, both of Midland, Mich., and Victor S. Chang, Ellicott City, Md., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 463,645, Jan. 11, 1990, Pat. No. 5,122,906, and a continuation-in-part of Ser. No. 466,168, Jan. 17, 1990, Pat. No. 5,122,905, each , Jan. 17, 0which is a continuation-in-part of Ser. No. 368,695, Jun. 20, 1989, abandoned. This application Nov. 26, 1990, Ser. No. 618,191

Int. Cl.[6] G02B *5/30;* **B29D** *11/00;* **B29C** *47/06*

U.S. Cl. 359—498 **11 Claims**

1. A method of making a birefringent interface polarizer comprising the steps of:



providing at least first and second polymeric materials having respective nonzero stress optical coefficients,

coextruding said first and second polymeric materials in multiple alternating layers in which said layers increase in thickness to produce a player thickness gradient, and

stretching said layers such that said first and second polymeric materials become oriented and produce a refractive index mismatch in a first plane which is different from the refractive index mismatch between said first and second polymeric materials in a second plane normal to said first plane.

5,486,950

PHASE CORRECTING ZONE PLATE

Gary Collinge, Suffolk, United Kingdom, assignor to Flat Antenna Company Limited, United Kingdom

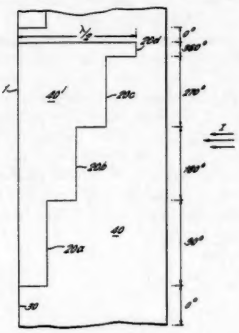
Filed Mar. 30, 1993, Ser. No. 39,860

Claims priority, application United Kingdom, Jul. 9, 1992, 9214562

Int. Cl.[6] G02B *27/44*

U.S. Cl. 359—565 **18 Claims**

1. A zone plate for focusing radiation, the zone plate comprising:



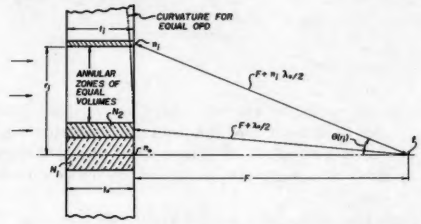
a plurality of reflective surface portions corresponding to zones of said zone plate; wherein said zone plate is a 1/L zone plate, and L is an integer greater than 2; said surface portions being positions in a plurality P of adjacent parallel planes from a first plane to a P^{th} plane, where P=nL+1 and n is an integer; said surface portions being arranged in a plurality of groups, adjacent surface portions in each group being positioned in adjacent parallel plens to form a succession of adjacent surface portions from said first plane to said P^{th} plane, so that each surface portion diffracts radiation out of phase with respect to adjacent surface portions such that radiation diffracted by said surface portions constructively interferes at a focus of said zone plate;

wherein the P^{th} plane is dielectrically spaced from the first plane by $n\lambda/2$, where λ is the wavelength of the radiation and n is an integer greater than zero, and the width of the surface portions provided in the first and P^{th} planes is less than the width of the adjacent surface portions in adjacent second and $(P-1)^{th}$ planes respectively, the sum of the widths of a surface portion in the first plane of one group and a surface portion in the P^{th} plane of an adjacent group is equal to a 1/L wave zone of said zone plate, and said surface portions in the first and P^{th} planes diffract radiation in phase.

5,486,951
GRADIAL ZONE LENS AND METHOD OF FABRICATION

David P. Hamblen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 16, 1993, Ser. No. 169,839
Int. Cl.[6] G02B *5/18;27/44;* **B29D** *11/00*
U.S. Cl. 359—565 **10 Claims**



1. A method of making a diffractive lens, comprising the steps of:

providing a mold having an axis and a mold cavity symmetrically surrounding the axis, the cavity having a desired geometry for at least one exterior surface of the diffractive lens;

spinning the mold about the axis;

injecting a first volume of optically transparent material into the cavity during the spinning, thereby placing the first volume at a periphery of the cavity to define a radially outer zone of the diffractive lens;

curing the first volume within the outer zone to at least partially solidify the material;

injecting a second volume of optically transparent material into the cavity during the spinning, thereby placing the second volume against an inner periphery of the outer zone to define a first radially inner zone of the diffractive lens;

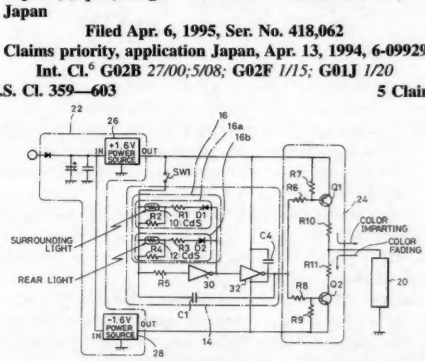
curing the second volume within the first inner zone to at least partially solidify the material; and

repeating the injecting and curing steps to define and cure subsequent inner zones of the diffractive lens until the mold cavity is filled with concentric zones of cured material.

5,486,952
DEVICE FOR DRIVING AN EC ANTIGLARE MIRROR

Mitsuyoshi Nagao; Hidenori Sato, and Michiaki Hattori, all of Fujieda, Japan, assignors to Murakami Kaimeido Co., Ltd., Japan

Filed Apr. 6, 1995, Ser. No. 418,062
Claims priority, application Japan, Apr. 13, 1994, 6-099291
Int. Cl.[6] G02B *27/00;5/08;* **G02F** *1/15;* **G01J** *1/20*
U.S. Cl. 359—603 **5 Claims**



1. A device for driving an EC antiglare mirror in which reflectivity is variably controlled by an EC element comprising:

surrounding light quantity detection means for detecting quantity of light surrounding a vehicle;

rear light quantity detection means for detecting quantity of light in the rear of the vehicle;

oscillation means for generating an oscillation signal of an "H" level and an oscillation signal of an "L" level repeatedly and alternately, said oscillation means being capable of individually controlling duration of the "H" level and duration of the "L" level;

inversion period control means for variably controlling duration of one of the "H" and "L" levels of the oscillation signal generated by said oscillation means in response to light quantity detected by said surrounding light quantity detection means and variably controlling duration of the other of the "H" and "L" levels of the oscillation signal in response to light quantity detected by said rear light quantity detection means;

a drive power source for driving the EC element; and

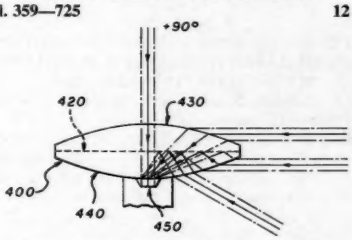
EC element drive means for inverting the polarity of drive voltage supplied from the drive power source in response to the "H" or "L" level of the oscillation signal generated by said oscillation means and applying the inverted drive voltage to the EC element,

said inversion period control means performs control, when said EC element drive means is so set that it drives the EC element in a color imparting direction at the one level of the oscillation signal and in a color fading direction at the other level of the oscillation signal, in such a manner that, when the surrounding light quantity is larger, the duration of the one level is shorter and, when the surrounding light quantity is smaller, the duration of the one level is longer and that, when the rear light quantity is larger, the duration of the other level is shorter and, when the rear light quantity is smaller, the duration of the other level is larger and, when said EC element drive means is so set that it drives the EC element in a color fading direction at the one level of the oscillation signal and in a color imparting direction at the other level of the oscillation signal, in such a manner that, when the surrounding light quantity is larger, the duration of the one level is longer and, When the surrounding light quantity is smaller, the duration of the one level is shorter and that, when the rear light quantity is larger, the duration of the other level is longer and, when the rear light quantity is smaller, the duration of the other level is shorter.

5,486,953
HYPERHEMISPHERICAL FIELD OF VIEW OPTICAL SENSOR HEAD

Ker-Li Shu, New Milford, Conn., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 20, 1993, Ser. No. 170,137
Int. Cl.[6] G02B *13/06;5/14;* **G01J** *1/20*
U.S. Cl. 359—725 **12 Claims**



1. An optical sensor head for providing a wide field of view comprising:

first and second lenses, each of the lenses having a planar surface and a convex surface, said first and second lenses positioned so that their planar surfaces face each other and are parellel;

a beam splitting means for reflecting a portion of light thereon, said beam splitting means being positioned between said planar surfaces;

a optical sensor means for detecting light, said optical sensor means located adjacent to and facing the convex surface of the second lens.

5,486,954

OPTICAL DEVICE HAVING AN OPTICAL LENS AND A MOUNTING ASSEMBLY

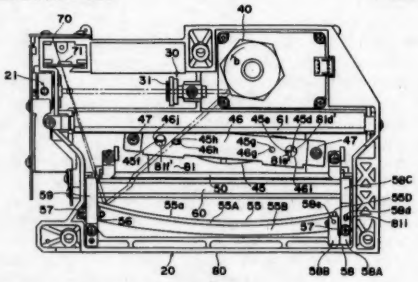
Tetsuji Niikawa; Hiromu Nakamura; Toshio Naiki, and Jun Kohsaka, all of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Division of Ser. No. 619,898, Nov. 28, 1990, Pat. No. 5,301,060. This application Jan. 4, 1994, Ser. No. 177,263

Claims priority, application Japan, Nov. 30, 1989, 1-312951; Nov. 30, 1989, 1-312952

Int. Cl.[6] G02B *7/02*

U.S. Cl. 359—818 **9 Claims**



1. An optical device comprising:

a base plate which has a mounting surface;

a lens which has an elongated transmitting surface and a pressing surface brought into pressing contact with the mounting surface of said base plate such that said lens is supported on the mounting surface;

said lens being provided, on a surface of said lens opposite to the pressing surface, with first and second projections; and

a clamp member which has a clamp surface and depresses said lens downwardly through contact of the clamp surface with said lens so as to mount said lens on the mounting surface;

said clamp member being formed, on the clamp surface, with first and second holes engageable with said first and second projections of said lens, respectively;

the second hole being an elongated opening extending in a longitudinal direction of said lens.

5,486,955

VIDEO TAPE RECORDER IN WHICH A VIDEO SIGNAL TO BE DISPLAYED IS PRODUCED BY UTILIZNG A SINGLE MAIN MAGNETIC HEAD

Masafumi Kodama, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 968,689, Oct. 30, 1992, abandoned, which is a division of Ser. No. 459,307, Dec. 29, 1989, Pat. No. 5,179,477. This application Mar. 14, 1994, Ser. No. 209,491

Claims priority, application Japan, Jan. 21, 1989, 1-12962; Jan. 21, 1989, 1-12963; Feb. 1, 1989, 1-24345

Int. Cl.[6] H04N *5/78*

U.S. Cl. 360—10.3 **10 Claims**

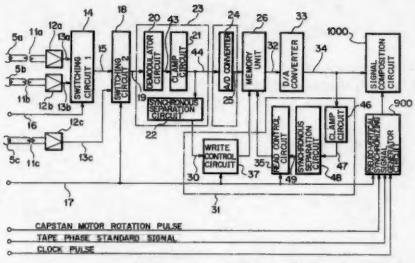
1. A video tape recorder comprising:

a rotary drum including,

primary record/reproduction means consisting essentially of an independent single rotary head, and

at least a pair of other rotary heads,

said independent single rotary head developing an FM display signal having a video signal only in FM field intervals which alternate with no-signal field intervals;



inserting means for inserting FM non-display signals developed by said pair of other rotary heads into said no-signal field intervals of said FM display signal developed by said independent single rotary head to produce a continuous FM signal;

signal processing means for demodulating the continuous FM signal to develop a demodulated FM display signal including demodulated video signal portions and FM non-display signal portions; and

replacing means for replacing the FM non-display signal portions of said demodulated FM display signal with the demodulated video signal portions of said demodulated FM display signal to produce a compensated reproduced video signal.

5,486,956

DIGITAL SIGNAL REPRODUCING CIRCUIT WHICH COUNTS THE INCREASING AMOUNT OF BRANCH METRIC TO CONTROL AN EQUALIZER

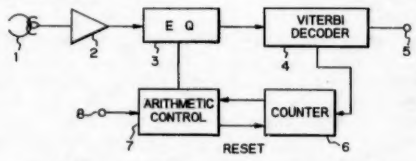
Kaoru Urata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 8, 1993, Ser. No. 148,344

Claims priority, application Japan, Nov. 13, 1992, 4-328620

Int. Cl.[6] G11B *5/035;5/09;* **H03D** *1/00*

U.S. Cl. 360—65 **3 Claims**



1. A digital signal reproducing circuit for reproducing a digital signal recorded on a recording medium, comprising:

an equalizing circuit for receiving an RF signal reproduced from the recording medium and varying at least one of gain characteristics and phase characteristics thereof with a control signal;

a Viterbi decoder for receiving an output signal of said equalizing circuit; and

a control unit for generating said control signal for said equalizing circuit,

wherein said control unit is adapted to generate said control signal to control said equalizing circuit so as to minimize an increasing amount of a branch metric of said Viterbi decoder and wherein said control unit comprises:

a counter for counting the increasing amount of the branch metric of said Viterbi decoder; and

an arithmetic control unit for generating said control signal fed to said equalizing circuit corresponding to an output of said counter.

5,486,957

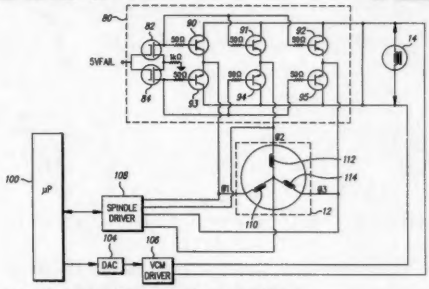
DISK DRIVE WITH RECTIFIER CIRCUIT FOR PARKING THE HEAD CARRIERS ON POWER DOWN

Thomas R. Albrecht, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1994, Ser. No. 252,304

Int. Cl.[6] G11B *21/02*

U.S. Cl. 360—75 **10 Claims**



1. A data recording disk drive comprising:

at least one data disk;

a multi-phase spindle motor having a winding for each phase and connected to the disk for rotating the disk;

a transducer for writing data to or reading data from the disk;

a carrier supporting the transducer;

a voice coil motor actuator connected to the carrier for moving the carrier generally radially across the disk so the transducer may access different regions of data on the disk; and

a circuit for converting back electromotive force from the spindle motor to current for the actuator when power to the spindle motor is removed, the circuit comprising a switch responsive to the removal of power to the spindle motor and a plurality of paired bipolar transistors, each pair of transistors being associated with a different one of the windings, each transistor having its emitter-base junction connected in series between its associated winding and the switch and its emitter-collector junction connected in series between its associated winding and the coil of the actuator; whereby in response to closing of the switch the freely rotating spindle motor generates current through successive windings to emitter-base junctions of associated transistors to successively turn on the transistors and thereby direct remaining current from the windings to the coil of the actuator.

5,486,958

VIDEO CASSETTE TAPE RECORDER WITH SINGLE LOADING MOTOR, ACTUATING PLATE AND FAST WINDING PLATE

Jeong D. Choi; In K. Cheon, both of Seoul; Geun H. Song, Kyungki, and Hee Y. Park, Seoul, all of, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 17, 1993, Ser. No. 153,899

Claims priority, application Rep. of Korea, Nov. 21, 1992, 21990/1992; Nov. 21, 1992, 23016/1992

Int. Cl.[6] G11B *5/027*

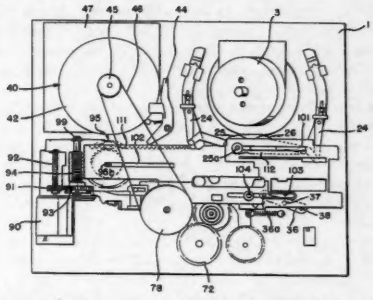
U.S. Cl. 360—85 **12 Claims**

1. A video cassette tape recorder having a base plate and a rotation head drum for recording video and audio signals on a magnetic tape and reproducing the recorded signals, comprising:

a supply reel and a take-up reel rotatably mounted on said base plate;

a single loading motor fixedly mounted to the base plate and adapted to generate a force for both loading a cassette and threading the tape;

mode switch means for sensing an operation mode and controlling said single loading motor according to the sensed operation mode;



an actuating plate is drivingly connected to said single loading motor;

a pair of slant post assemblies for guiding the tape out of a tape cassette, each of said slant post assemblies having a slant post and a guide roller;

a pair of link type loading arms connected between said slant post assemblies and a pair of loading gears which are driven by said actuating plate, whereby each of said slant post assemblies are moved between a tape threaded position and a tape unthreaded position;

a capstan motor and a pinch drive assembly disposed on said base plate for feeding the tape, said pinch drive assembly being driven by said single loading motor and including a pinch roller for pressing the tape against a capstan shaft of said capstan motor;

idler means, in connection with said capstan motor, for rotating said supply reel and said take-up reel;

brake means for braking the supply reel and the take-up reel;

means for initiating a fast winding operation mode for winding the tape at a high speed in response to movement of the actuating plate to a predetermined position, said means for initiating including a fast winding plate engageable and disengageable with said actuating plate and means for engaging said idler means when said fast winding plate is engaged with said actuating plate to thereby rotate the supply reel and the take-up reel at a high speed; and

a front loading housing operatively connected with said single loading motor to move said tape cassette between a tape cassette loading position and a tape cassette unloading position.

5,486,959

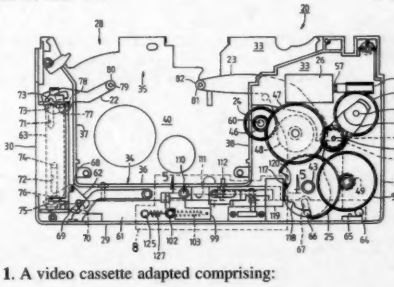
ADAPTER MECHANISM FOR EXTRACTING AND RETRACTING VIDEO TAPE FROM MINIATURE CASSETTES

David Tai, 1st Fl., No. 17, Lane 180, Ho-Chiang Street, Taipei, Taiwan, Prov. of China

Filed Jul. 12, 1994, Ser. No. 273,796

Int. Cl.[6] G11B *5/008*

U.S. Cl. 360—94 **9 Claims**



1. A video cassette adapted comprising:

a housing having a front portion, a back portion, a first and second side portion, a top wall, a bottom wall and a recess for receiving a video cassette, said recess having a front portion communicating with said front portion of said housing, a back portion, a first and second side portions, a top opening and a bottom wall;

a first tape-driving member one end of which is pivotally disposed between said first side portion of said housing and said first side portion of said recess, and the other end of which is reversibly moveable from said front portion of said recess to said front portion of said housing and having a roller rotatably coupled thereto for engaging a portion of a tape of the video cassette;

a second tape-driving member one end of which is pivotally coupled to said housing between said second side portion of said housing and said second side portion of said recess by a pivot shaft, and the other end of which is reversibly moveable from said front portion of said recess to said front portion of said housing and having a roller rotatably coupled thereto for engaging a portion of the tape of the video cassette;

linkage means disposed within said housing and coupled to both said first tape-driving member and said second tape-driving member for displacing each with respect to the other;

a first gear rotatably disposed in said housing and extending into said second side portion of said recess for meshing with a gear disposed on a tape-winding shaft of the video cassette;

a second gear coaxially coupled to said pivot shaft for rotation with said second tape-driving member;

a motor disposed in said housing, said motor being selectably operable to rotate a motor shaft in both a clockwise and a counterclockwise direction; and

a selective power-transmitting mechanism including a power inputting portion and a power outputting portion, said power inputting portion being operably connected with said motor shaft, said selective power-transmitting mechanism being pivotally disposed in said housing with said power outputting portion automatically displaced between a first selection position to couple said power outputting portion with said first gear responsive to counterclockwise rotation of said motor shaft and a second selection position to couple said power outputting portion with said second gear responsive to clockwise rotation of said motor shaft said power outputting portion driving said second tape-driving member through said second gear and said first tape driving arm through said linkage means to move from said front portion of said recess to said front portion of said housing and pull a tape of the video cassette out of the cassette to said front portion of said housing responsive to said clockwise rotation of said motor shaft, said power outputting portion driving said first gear responsive to said counterclockwise rotation of said motor shaft for driving the gear of the tape-winding shaft of the video cassette to wind the tape respectively engaging said rollers of said first and second tape-driving members from said front portion of said housing into the video cassette and thereby displace said first and second tape driving members respectively from said front portion of said housing to said front portion of said recess.

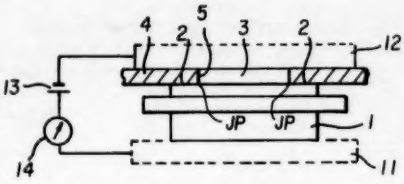
5,486,960

DISK STORAGE DEVICE WITH ELECTROSTATICALLY BONDED INFORMATION STORAGE DISK

Shigemasa Saito, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Japan

Filed Sep. 7, 1994, Ser. No. 301,460
Claims priority, application Japan, Sep. 9, 1993, 5-223761
Int. Cl.[6] G11B *17/02*
U.S. Cl. 360—99.08 **14 Claims**

1. A disk storage device including: a spindle motor; a hub rotatably coupled to the spindle motor; and a magnetic information storage disk including a disk hole fixed to the hub by an electrostatically bonded fixing portion that forms a permanent physical bond between the disk hole and the hub.

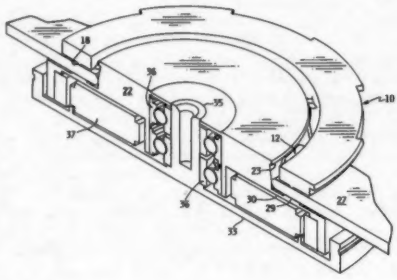


5,486,961

RESILIENT COMPLIANT CLAMP FOR DATA STORAGE DISK DRIVES

Zine-Eddine Boutaghou; Randy J. Bornhorst, and Douglas W. Johnson, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1994, Ser. No. 298,490
Int. Cl.[6] G11B *17/02*
U.S. Cl. 360—99.12 **6 Claims**



1. A disk data storage device comprising:

a base;

at least one disk having first and second surfaces, said first surface being axially spaced from said second surface, at least one of said first and second surfaces having a layer for recording data;

a hub mounted for rotation on said base, said hub supporting said at least one disk at said first surface of said disk and presenting a flange in axial spaced relation to said at least one disk at said second surface of said disk;

a resilient clamping member clamping said disk to said hub, comprising

(a) an annulus formed of resilient material including a first portion at an inner radius of said annulus, the annulus first portion extending radially inward and axially toward said flange to fixedly secure said annulus first portion to said hub and maintain said annulus in a deformed state, and

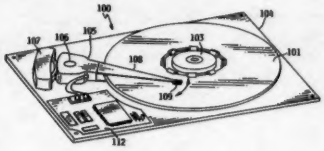
(b) a projecting portion of said annulus at an annulus lower surface of said annulus, the projecting portion confronting said at least one disk and deforming against the second surface of said disk when said annulus is maintained in said deformed state and said annulus first portion is retained by said flange, whereby said disk is compressively clamped to said hub; and

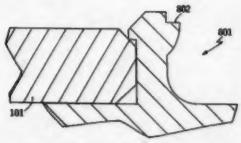
a transducer mounted on an actuator for accessing data recorded in said layer of said disk.

5,486,962
INTEGRAL HUB AND DISK CLAMP FOR A DISK DRIVE STORAGE DEVICE

Zine-Eddine Boutaghou, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 12, 1994, Ser. No. 322,716
Int. Cl.[6] G11B *17/028*
U.S. Cl. 360—99.12 **1 Claim**



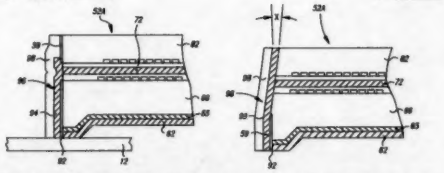


1. A rotating disk data storage device, comprising:
a disk drive base;
a rotatably mounted disk for recording data, said disk having an axis of rotation, first and second surfaces perpendicular to said axis of rotation, and a circular aperture at its center;
a rotatable hub for mounting said disk;
a clamping structure for clamping said disk to said rotatable hub, said clamping structure comprising a supporting surface contacting said first surface of said rotatably mounted disk, and a plurality of circumferentially spaced fingers, each said finger including a pawl at one end thereof, said fingers extending through said circular aperture of said disk, said pawls engaging said disk and imparting an axial force to said disk forcing said first surface of said disk against said supporting surface; wherein each said finger contains a projecting tab for engagement with a disk removal tool, said projecting tab projecting from a side of said finger facing said disk axis
a spindle motor for rotating said disk;
at least one transducer head for reading data stored on said disk; and
a moveable actuator mounted on said disk drive base for positioning said transducer head to read data recorded on said disk.

5,486,963
INTEGRATED TRANSDUCER-SUSPENSION STRUCTURE FOR LONGITUDINAL RECORDING

Robert E. Jones, Jr., San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 932,826, Aug. 19, 1992, abandoned. This application Jun. 1, 1994, Ser. No. 252,147
Int. Cl.[6] G11B *5/105;5/127*
U.S. Cl. 360—104 **9 Claims**

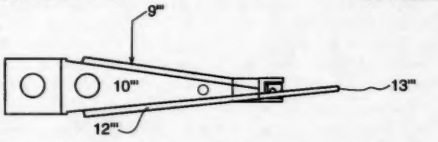


1. A combination thin film magnetic head transducer and suspension system for longitudinal recording comprising:
a horizontal thin film first pole piece having a pole tip;
a substantially vertical thin film magnetic gap layer having oppositely facing first and second substantially vertical thin film surfaces;
the first and second vertical thin film surfaces being made by a process of thin film deposition without lapping;
the first thin film surface of the thin film magnetic gap layer directly contacting the pole tip of the horizontal thin film first pole piece;
a thin film second pole piece having a vertical component which has a pole tip directly contacting the second vertical thin film surface of the thin film magnetic gap layer and a horizontal component magnetically isolated from but adjacent and parallel to said first pole piece said first and second pole pieces magnetically connected at a back gap region and magnetically isolated at their pole tips by said magnetic gap;
a thin film coil electrically isolated from but magnetically activating said first and second pole pieces and encircling the horizontal component of said second pole piece;
said first and second pole pieces configured with a wider surface at their backgap region and narrower surfaces at their pole tips;
a suspension layer of a thin film layer of a resilient material at least covering said second pole piece horizontal component and electrically and magnetically isolated from said second pole piece and said coil, said resilient material extending beyond the back gap region;
the pole tip of the first pole piece being horizontal and substantially perpendicular to the vertical component of the second pole piece;
the first pole piece having a downwardly sloping portion which is adjacent to the pole tip of the first pole piece;
the first pole piece narrowing in width from said sloping portion to the pole tip; and
the vertical component of said second pole piece having an essentially vertical portion on an end adjacent to said magnetic gap layer and having a portion on a second end which is angled away from the essentially vertical portion to contact the horizontal component of said second pole piece.

5,486,964
MINIATURE DISK DRIVE WITH DYNAMIC HEAD LOADING WITH SKEWED LIFTING TAB

James H. Morehouse, Jamestown; David M. Furay; Steven B. Volk, both of Boulder; Michael R. Utenick, Englewood; James A. Dunckley; John H. Blagaila, both of Boulder; James F. Hopper, Louisville, and Thomas A. Klein, Boulder, all of Colo., assignors to Integral Peripherals, Inc., Boulder, Colo.

Continuation of Ser. No. 112,909, Aug. 27, 1993, abandoned, which is a division of Ser. No. 629,948, Dec. 19, 1990, abandoned. This application May 5, 1995, Ser. No. 435,243
Int. Cl.[6] G11B *5/54*
U.S. Cl. 360—105 **30 Claims**



1. A disk drive information storage device comprising:
a housing having a first external dimension of about 51 mm;
disk means for recording and reproducing information, said disk means being supported by said housing for rotation;
an actuator comprising a body portion supported by said housing for rotation about an axis, and a load beam connected to said body portion for rotation of a first end of said load beam in a plane substantially parallel to a surface of said disk means, said load beam having a centerline and said load beam further including an elongated lift tab having a free end which

extends beyond said first end of said load beam, said lift tab extending along an axis which is skewed from said centerline of said load beam;

a slider body including a transducer means for recording information on and reproducing information from said disk means;

means connected to said load beam and said slider body for supporting said slider body adjacent to said first end of said load beam and at a position intermediate said first end of said load beam and said axis of rotation of said body portion; and

a cam assembly supported by said housing adjacent to said lift tab and the edge of said disk means, said cam assembly including a cam surface positioned in operative relationship with said lift tab, whereby a contact between said cam surface and said lift tab provides a lifting force on said load beam.

5,486,965

ROTARY INFORMATION RECORDING/REPRODUCING APPARATUS CARRIAGE ACTUATOR ARRANGEMENT

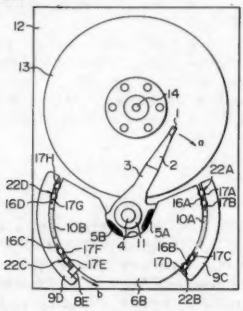
Takeshi Yoshida; Hideaki Amano, both of Odawara; Takashi Kohno, Ibaraki; Kenji Mori, Hadano; Takashi Yoshida, Ibaraki, and Hiromu Hirai, Tsukuba, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1994, Ser. No. 198,593

Claims priority, application Japan, Feb. 18, 1993, 5-029230

Int. Cl.[6] G11B *5/55*

U.S. Cl. 360—106 **39 Claims**



1. A rotary information recording/reproducing apparatus including at least one disk for recording information, a carriage supporting a head to record/reproduce information on or from said disk and being rotatable in a substantially radial direction of said disk to position said head relative to said disk, a carriage actuator for applying a torque to said carriage, and a housing comprising a base and a cover to support and accommodate said disk, said head, said carriage and said carriage actuator, said carriage actuator including two driving coils fixed to said carriage and a magnet-yoke assembly which comprises permanent magnets and at least one yoke, the arrangement being such that an angle formed between a line connecting a center of the first driving coil and a center of a carriage pivot shaft and another line connecting said head and the center of said carriage pivot shaft is not larger than 90 degrees and that an angle formed between the center lines of the first and second driving coils about the center of said carriage pivot shaft is within the range of from 100 degrees to 150 degrees, said first and second driving coils being flat in shape, means for supporting said magnet-yoke assembly, said supporting means being mounted on one surface of said base outwardly of an outer peripheral surface of said magnet-yoke assembly, said magnet-yoke assembly supporting means being arranged to be within a distance between said one surface of said base and an end face of said magnet-yoke assembly spaced from said one base surface.

5,486,966

HEAD DRUM GROUND SYSTEM FOR USE IN A VIDEO CASSETTE RECORDER

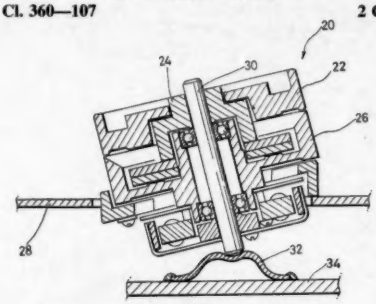
Seong-Ick Ahn, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 22, 1994, Ser. No. 294,529

Claims priority, application Rep. of Korea, Aug. 24, 1993, 93-16474

Int. Cl.[6] G11B *5/52;5/027*

U.S. Cl. 360—107 **2 Claims**



1. A video cassette recorder incorporating therein a ground system for discharging static electricity generated from a head drum assembly therein which includes a rotary drum having a rotating shaft rotatably supported by at least one bearing, and a stationary drum mounted on a deck within the video cassette recorder, said ground system comprising:

a printed circuit board having a grounding terminal; and

an electrical coupler electrically connected to the grounding terminal of the printed circuit board at its opposite ends and resiliently contacted with a lower segment of the rotating shaft, said electrical coupler being a flexible printed circuit board having an electrically conductive member for contacting with the lower segment of the rotating shaft and an enclosure surrounding said conductive member for resiliently supporting the same, the enclosure having a cutout portion for allowing a part of the conductive member to be exposed.

5,486,967

MAGNETIC DISK MEMORY SYSTEM

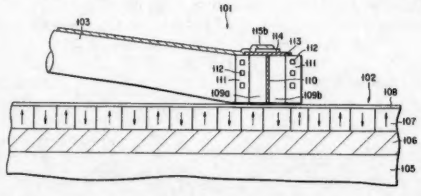
Yoichiro Tanaka, Kawasaki; Kazushi Tanimoto, Tokyo; Hiroshi Ohashi, Tokyo; Takashi Hikosaka, Tokyo; Yasuo Ohtsubo, and Shigeru Hoshina, both of Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1994, Ser. No. 212,120

Claims priority, application Japan, Mar. 15, 1993, 5-054367

Int. Cl.[6] G11B *5/39;5/31*

U.S. Cl. 360—113 **20 Claims**



1. A magnetic disk memory system comprising:

a magnetic disk of a perpendicular recording type, including a soft magnetic backing layer and a magnetic recording layer of a perpendicular magnetic anisotropy formed on said backing layer; and

a magnetic head for writing and reading data with respect to said magnetic disk wherein said magnetic head comprises:

(a) a pair of main magnetic poles each being made of a material having a high magnetic permeability and each having a first end and a second end, each second end defining a second end surface, said first end of each magnetic pole being located so as to face a surface of said magnetic disk;

(b) a non-magnetic interlayer provided between said pair of main magnetic poles;

(c) a recording coil disposed so as to generate a magnetic flux passing through said magnetic disk via said pair of main magnetic poles; and

(d) an MR element having a film-like shape provided via an insulation layer on each of said second ends of said pair of main magnetic poles, said MR element having a film surface parallel to said second end surfaces of said pair of main magnetic poles, and being magnetically coupled with said pair of main magnetic poles.

5,486,968

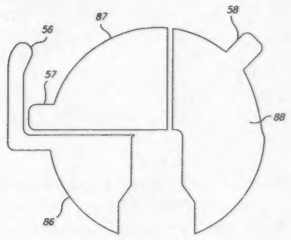
METHOD AND APPARATUS FOR SIMULTANEOUS WRITE HEAD PLANARIZATION AND LEAD ROUTING

Hin P. E. Lee, San Jose, and Douglas J. Werner, Fremont, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1993, Ser. No. 149,891

Int. Cl.[6] G11B *5/31;5/17;5/39*

U.S. Cl. 360—126 **51 Claims**



1. An inductive head assembly formed on a substantially planar first surface, comprising:

a lower pole piece formed over a first portion of said first surface, having a first pole tip and a first back gap portion

at least two electrically isolated planar sections of conductive material formed over a second portion of said first surface in close proximity to and substantially coplanar with said lower pole piece to provide therewith a substantially planar second surface;

a coil formed over said substantially planar second surface, wherein the center of said coil is disposed over said first back gap portion; and

an upper pole piece formed over a portion of said coil, said upper pole piece having a second pole tip and a second back gap portion connected to said first back gap portion through said center of said coil, wherein said first and second pole tips form a write gap.

5,486,969

MAGNETIC HEAD CORE HAVING FERRITE MEMBER REINFORCED BY NON-MAGNETIC MATERIAL

Fuminori Takeya, Iwakura, and Tomio Suzuki, Yokkaichi, both of, Japan, assignors to NGK Insulators, Ltd., Japan

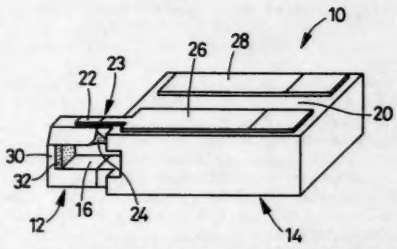
Filed Jun. 13, 1994, Ser. No. 258,836

Claims priority, application Japan, Jun. 28, 1993, 5-185467

Int. Cl.[6] G11B *5/133*

U.S. Cl. 360—127 **8 Claims**

1. A head core for a magnetic head for recording information on a magnetic recording medium, comprising:



a first ferrite member and a second ferrite member butted and bonded together to form an annular, closed magnetic path around a coil-winding groove, upper portions of said first and second ferrite members providing a sliding surface to which the magnetic recording medium is opposed, said sliding surface extending across the first and second ferrite members in a direction in which said recording medium slides;

a coil attached to a coil-winding portion of said first ferrite member; and

a non-magnetic material secured to at least one of an inner surface and an outer surface of said coil-winding portion of said first ferrite member and spaced from said second ferrite member, said inner and outer surfaces being opposed to one another in said direction, such that said non-magnetic material extends over the entire length of said coil-winding portion, said non-magnetic material being spaced below said sliding surface apart from the magnetic recording medium by a portion of said first ferrite member which provides a part of said sliding surface.

5,486,970

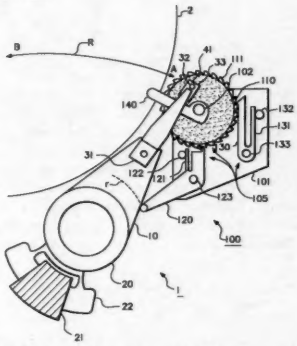
CLEANING APPARATUS FOR HEADS OF DATA STORAGE DISKS

Neville K. Lee, Sherborn, and Hisashi Katao, Shrewsbury, both of Mass., assignors to Quantum Corporation, Milpitas, Calif.

Division of Ser. No. 293,106, Aug. 19, 1994, Pat. No. 5,467,238, which is a continuation of Ser. No. 88,293, Jul. 6, 1993, abandoned. This application Mar. 21, 1995, Ser. No. 408,415

Int. Cl.[6] G11B *5/41;3/58*

U.S. Cl. 360—128 **8 Claims**



1. A head cleaning apparatus comprising;

a base;

a read/write head;

a disk rotatably journalled to the base;

an actuator movably mounted relative to the base upon an air bearing formed by relative rotation of the head and disk and carrying said head in operable relationship with the disk, movements of said actuator for positioning said head relative

to said disk and for placing said head into a cleaning contact relationship with a rotating head cleaning pad;

the rotating head cleaning pad having a plurality of head cleaning paths;

a toothed wheel rotatably mounted to the base, said toothed wheel having side surfaces, the head cleaning pad mounted on one of said side surfaces;

a first pawl pivotally mounted on the base, said first pawl positioned and dimensioned relative to the toothed wheel and the actuator such that as the actuator places said head into the cleaning contact relationship with the cleaning pad, the actuator contacts a first end on the first pawl, initiating a second end on the first pawl to rotationally advance the toothed wheel as the head simultaneously wipes across the cleaning pad to define one of the plurality of head cleaning paths;

a biasing means integral with the first pawl for engaging the second end of the first pawl with a subsequent tooth of the toothed wheel after the cleaning contact relationship is complete and the actuator loses contact with the first end of the first pawl; and

a second pawl mounted on the base and engaged coupled to the toothed wheel to bias the rotation of the toothed wheel.

5,486,971

CENTRAL HUBS FOR FLEXIBLE MAGNETIC DATA DISCS FORMED OF MAGNETICALLY SOFT POLYACETAL COMPOSITIONS

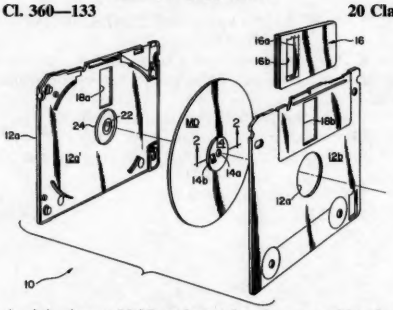
Patrick M. Hughes, Plano, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 683,953, Apr. 12, 1991, Pat. No. 5,214,555. This application Dec. 23, 1992, Ser. No. 996,333

The portion of the term of this patent subsequent to May 25, 2010, has been disclaimed.

Int. Cl.[6] G11B *23/03*

U.S. Cl. 360—133 **20 Claims**



1. An injection-moldable polyacetal resin composition having soft magnetic properties characterized by high initial and maximum permeabilities, magnetic remanence closely approaching saturation, and small coercive force and hysteresis loss, said composition consisting essentially of a polyacetal base resin, and at least about 40% by weight, based on the total composition weight, of elemental iron particles wherein the iron particles are homogeneously dispersed through the resin to impart magnetically soft properties to the composition.

5,486,972

AC POWERED ELECTRICAL CONTROL DEVICE WITH LOGIC LEVEL CONTROL

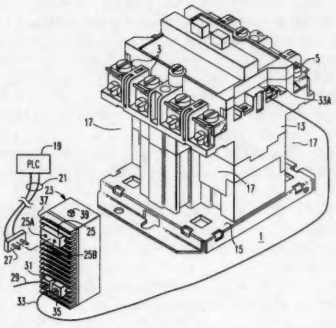
Glen D. Taylor, Fayetteville, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 30, 1993, Ser. No. 176,151

Int. Cl.[6] H01H *47/32;50/04;45/12*

U.S. Cl. 361—154 **13 Claims**

1. An electric power switching device operated by ac power and comprising:



an insulated housing including an exterior surface defining a cavity that is exterior of said housing; separable electrical contacts within said housing; electromagnetic means within said housing including a coil energized by said ac power to move said separable contacts between open and closed positions; a control module mounted in said cavity comprising solid state switching means responsive to an externally generated logic level signal for selectively connecting said coil to said ac power receiving means for receiving said logic level signal operatively connected to said solid state switching means.

5,486,973

POSTAGE METER INCLUDING A SAFETY LOCKING CIRCUIT

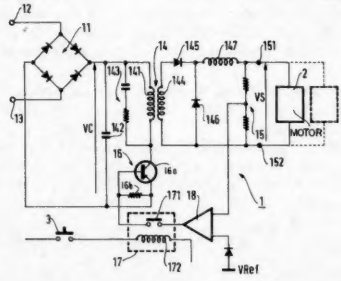
Jean-Pierre Meur, La Ville Du Bois, France, assignor to Neopost Industrie, Bagneux, France

Filed Sep. 15, 1994, Ser. No. 306,330

Claims priority, application France, Sep. 24, 1993, 93 11395

Int. Cl.[6] H02M *3/335;* **G07B** *17/00;* **H01H** *13/18*

U.S. Cl. 361—170 **5 Claims**



1. A mail-processing machine including an electrical power supply for powering at least one control motor, and a safety locking circuit electrically connected to a cover switch of the machine and co-operating with the electrical power supply to switch the power supply off whenever the cover of the machine is open, said electrical power supply including a chopper electrical power supply comprising at least one power chopper circuit having a control circuit, and wherein the safety locking circuit includes at least one electromechanical relay electrically connecting the power chopper circuit to its control circuit.

5,486,974

ELECTROSTATIC ATTRACTION BOARD SYSTEM

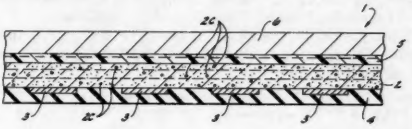
Keiji Kasahara, Kakegawa, Japan, assignor to Abisare Co., Ltd., Shizuoka, Japan

Filed Aug. 27, 1993, Ser. No. 113,396

Claims priority, application Japan, Dec. 3, 1992, 4-324307; Mar. 10, 1993, 5-049611

Int. Cl.[6] H02N 13/00

U.S. Cl. 361—234 12 Claims



1. An electrostatic attraction board system for use with a power source comprising:

(a) an attraction layer formed of a layered dielectric substance having a volume resistivity of 10^{11} to 10^{14} Ωcm;

(b) a coating layer formed on a first face of the attraction layer so as to cover the first face, the coating layer having a volume resistivity of 10^{10} to 10^{13} Ωcm, a thickness of 5 to 50μ a small vapor permeability and oxygen barrier properties; and

(c) at least a pair of electrodes on a second face of the attraction layer such that the electrodes are electrically separated from each other in a laminate structure, said electrodes adapted to be connected to the power source for establishing an electric field in order to cause polarization charge at the attraction layer, said attraction layer, said coating layer and said electrodes forming a laminate structure;

wherein an object placed on the first face of the attraction layer with the coating layer interposed therebetween can be attracted and held by means of coulomb force resulting from the electric field.

5,486,975

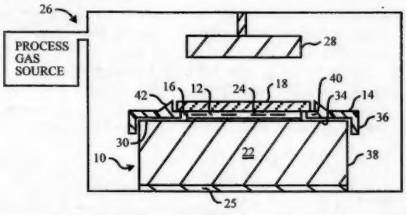
CORROSION RESISTANT ELECTROSTATIC CHUCK

Shamouil Shamouilian, San Jose, and Yoshi Tanase, Campbell, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jan. 31, 1994, Ser. No. 189,811

Int. Cl.[6] H02N 13/00

U.S. Cl. 361—234 24 Claims



1. A corrosion resistant apparatus for holding a substrate during processing with a corrosive gas, the apparatus comprising:

(a) an electrostatic chuck having an electrically insulative layer, the insulative layer having a top surface and an exposed side surface, the chuck being chargeable for holding the substrate thereon by electrostatic force; and

(b) a guard substantially enclosing the exposed side surface of the insulative layer for protecting the insulative layer against the corrosive gas, the guard being made from a sacrificial material that corrodes at least as quickly as the insulative layer corrodes when exposed to the corrosive gas.

5,486,976

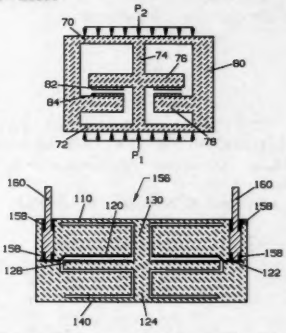
PRESSURE TRANSDUCER APPARATUS HAVING A RIGID MEMBER EXTENDING BETWEEN DIAPHRAGMS

Thomas J. Charboneau, Plainville; Douglas B. Strott, Attleboro; Dale R. Sogge, Wrentham, and Thomas R. Maher, Plainville, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 14, 1994, Ser. No. 339,040

Int. Cl.[6] H01G 7/00; G01L 9/12

U.S. Cl. 361—283.4 10 Claims



1. A pressure responsive capacitive transducer comprising

a generally rigid, annular wall extending along a longitudinal axis forming an opening between first and second ends,

first and second relatively thin, flexible diaphragms closing the first and second ends of the annular wall respectively,

a rigid pin attached to and extending between a central portion of the first and second diaphragms, a first rigid platform connected to the pin and extending laterally outwardly from the pin toward the annular wall but spaced therefrom,

a second rigid platform connected to the annular wall and extending laterally inwardly from the annular wall toward the pin but spaced therefrom and spaced a selected distance along the longitudinal axis from the first platform, the platforms having surface portions aligned with and facing each other with a selected gap between the platforms,

first and second electrical capacitor plates disposed on the surface portions of the first and second platforms, and

means to provide an electrical connection with the capacitor plates.

5,486,977

TANTALUM CAPACITOR CHIP, PROCESS FOR MAKING THE SAME AND TANTALUM CAPACITOR INCORPORATING THE SAME

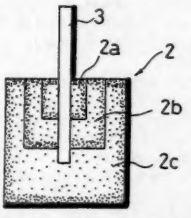
Miki Hasegawa, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Nov. 30, 1993, Ser. No. 159,386

Claims priority, application Japan, Dec. 8, 1992, 4-328154

Int. Cl.[6] H01G 9/052

U.S. Cl. 361—529 4 Claims



1. A tantalum capacitor chip comprising:

a chip body which is a compacted mass of tantalum powder; and

an anode wire partially inserted into and partially projecting from the chip body;

wherein the chip body has a plurality of integrated mass portions which have been divisionally compacted, each of the mass portions having a lower density region and at least one higher density region alternate with the lower density region; and

wherein the anode wire extends at least from one mass portion into another and penetrates through at least two higher density portions of said one and another mass portions,

wherein the respective mass portions are cross-sectionally different with one arranged around another.

5,486,978

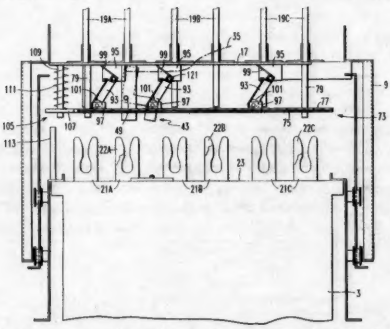
DRAW-OUT CIRCUIT BREAKER UNIT WITH COORDINATED CABLE INTERLOCK AND SHUTTER

Anthony J. Fishovitz, Freedom, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 4, 1994, Ser. No. 334,834

Int. Cl.[6] H02B *1/14*

U.S. Cl. 361—617 **11 Claims**



1. A draw-out circuit breaker unit breaker electrical distribution system having conductors with stabs on ends thereof; said unit comprising:

a first circuit breaker having connectors projecting from a rear face thereof for connection to said stabs, separable contacts for interrupting said current through said conductors, and a trip mechanism for tripping said separable contacts open in response to selected conditions of current in said conductors;

an enclosure having a rear wall in which said stabs on said conductors are mounted and means supporting said first circuit breaker for movement toward said rear wall to an installed position in which said connectors engage said stabs to connect said circuit breaker in a said electric power distribution system, and for movement away from said rear wall to disconnect said connectors from said stabs for removal of said circuit breaker from said enclosure;

a second circuit breaker;

interlock means comprising linking means linking said first circuit breaker with said second circuit breaker, and actuating means associated with said first circuit breaker for actuating said linking means to prevent closing of said second circuit breaker when said first circuit breaker is in said installed position and said separable contacts or said first circuit breaker are closed;

prevent means preventing actuation of said link means when said first circuit breaker is not in said installed position; and

said linking means comprising a drive member mounted adjacent said rear wall of said rear wall of said enclosure and a cable attached between said drive member and said second circuit breaker and wherein said actuating means comprises a plunger extending from said rear face of said first circuit breaker when said separable contacts are closed and operating said drive member to actuate said cable when extended with said first circuit breaker in said installed position, and wherein said prevent means prevents operation of said drive member when said first circuit breaker is moved out of said installed position.

5,486,979

ELECTRICITY SUPPLY ASSEMBLY

Peter W. Bowen, Sutton Coldfield, and Darren J. Shotter, Handsacre, both of, England, assignors to Crabtree Electrical Industries Limited, Walsall, United Kingdom

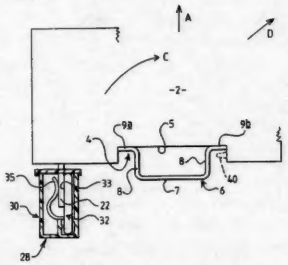
PCT No. PCT/GB92/00254, § 371 Date Feb. 16, 1994, § 102(e) Date Feb. 16, 1994, PCT Pub. No. WO93/04514, PCT Pub. Date Mar. 4, 1993

PCT Filed Feb. 12, 1992, Ser. No. 196,174

Claims priority, application European Pat. Off., Aug. 21, 1991, 91307670

Int. Cl.[6] H02B *1/04*

U.S. Cl. 361—640 **12 Claims**



1. An electricity supply assembly comprising:

a) an elongate housing of insulating material secured to and extending between two end support members;

b) an elongate supply member mounted in said housing, said supply member providing a contact face, said housing being provided with at least one narrow slot for access to said supply member;

c) an elongate mounting rail secured to and extending between said end support members, said mounting rail providing spaced mounting surfaces on which a circuit breaker is positioned, said circuit breaker having flat parallel sides which extend transversely of said mounting rail; wherein

i) said circuit breaker is provided in an underside thereof with a mounting recess receiving said mounting rail;

ii) said circuit breaker comprises a contact member projecting through an aperture in the underside of said circuit breaker to one side of said recess and through said slot into said housing;

iii) said contact member has a contact surface which lies in a plane extending transversely to the parallel sides of said circuit breaker; and

iv) resilient means is provided in said housing for urging said contact member transversely thereof so that said contact surface of said contact member is in face-to-face engagement with said contact face of said supply member.

5,486,980

METHOD AND APPARATUS FOR DISSIPATING THERMAL ENERGY

William D. Jordan, and Howard G. Hinshaw, both of Dallas, Tex., assignors to Thermalloy, Inc., Dallas, Tex.

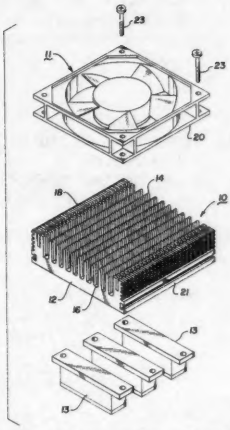
Continuation-in-part of Ser. No. 39,955, Mar. 30, 1993, abandoned. This application Sep. 8, 1994, Ser. No. 302,336

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—697 **14 Claims**

7. Heat sink apparatus for attachment to an electronic device package comprising:

(a) a heat sink body to be attached in contact with an electronic device package, said heat sink body comprising a base having



a bottom surface and a top surface with parallel pins extending outwardly from said top surface of said base with said pins separated by two sets of intersecting grooves; and

(b) a fan mounted at the outward extremity of said pins for forcing air through said grooves toward said base at an average velocity of at least about 400 feet per minute, the surface area of said heat sink body being sufficiently large to produce a thermal impedance of less than about 0.3° C./W under impingement cooling by said fan.

9. Heat sink apparatus as defined in claim **7** further comprising an insulated gate bipolar transistor affixed to said bottom surface.

5,486,981

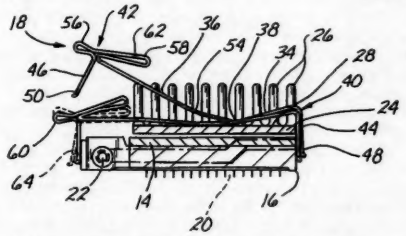
HEAT DISSIPATING ASSEMBLY

Michael L. Blomquist, Newbury Park, Calif., assignor to International Electronic Research Corporation, Burbank, Calif.

Filed Aug. 12, 1994, Ser. No. 289,925

Int. Cl.[6] **H05K** *7/20*

U.S. Cl. 361—704 **15 Claims**



1. A spring clip element for use in a heat dissipating assembly which includes a heat conductive body including a heat receiving surface adapted to be mounted in heat receiving relationship with a heat emitting surface of an electronic component and a heat discharging surface generally opposed to said heat receiving surface, said spring clip element being adapted to removably hold the heat conductive body in assembled configuration with the electronic component, said spring clip element comprising:

a generally elongated leaf spring segment normally having spring tension therein and having

a first end,

a second end,

a fulcrum location between said first and second ends,

a first leaf spring segment normally having a first spring tension therein,

a second leaf spring segment normally having a second spring tension therein,

said second end including generally a pivot location and normally having anti-rotation spring tension therein, and

a first leg element depending generally from said first end, a second leg element depending generally from said second end, said first leaf spring segment extending generally between said fulcrum location and said first leg element, and said second leaf spring segment extending generally between said fulcrum location and said second leg element,

said second leg element forming a post of a lever member, a bar member forming a cross piece of said lever member, said bar member including a release arm and an engagement arm, said bar member being adapted to cause said second leg element to rotate generally around said pivot location against the anti-rotation spring tension responsive to force applied to said bar member.

5,486,982

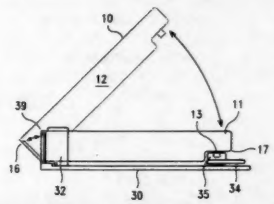
MODULAR ELECTRONIC PACKAGING FOR COMPUTER SERVERS

Winston Hsu, 14508 Pebblewood Dr., Gaithersburg, Md. 20878

Filed Jun. 10, 1994, Ser. No. 258,662

Int. Cl.[6] **H05K** *7/10*

U.S. Cl. 361—728 **32 Claims**



1. A modularized electronic system for packaging and assembling a plurality of electronic modules comprising:

(1) an enclosure case having at least one lower case assembly with a lower horizontal panel in it for module loading; the lower panel of the lower case assembly comprises at least one U-shaped holding means having two vertical planner panels on its left- and right-hand sides;

(2) an electronic backplane assembly having at least one receptacle and the backplane assembly is removably mounted to the lower case assembly for module connection;

(3) at least one electronic module assembly having a module head in its front end and a substantially rectangular module body behind the module head; the module head comprises a module connector on its bottom wherein the module connector of the module head is vertically plugged in and latched to the receptacle of the backplane assembly in a removable manner, and the left- and right-hand sides of the rear end of the module body engage and removably attach to the two vertical planner panels of the U-shaped holding means of the lower case assembly whereby the module assembly is reliably mounted to the lower case assembly by having its front end mounted to the receptacle of the backplane assembly and its rear end mounted to the U-shaped holding means;

the rear end of the module body further comprises a latching means and the rear end of the U-shaped holding means further comprises a correspondent latch receiving means wherein the latching means of the module body engages and removably attaches to the latch receiving means of the U-shaped holding means to prevent the rear end of the module body from moving upward after the module assembly is mounted to the lower case assembly.

5,486,983

LIGHTING MODULE FOR INSTRUMENTS WITH A LIQUID-CRYSTAL MATRIX

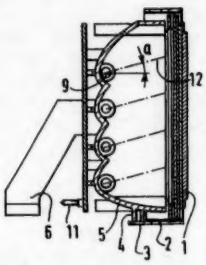
Maurice Cordier, Paris, and Bernard Veislinger, Parmain, both of, France, assignors to Sextant Avionique, France

Filed Sep. 16, 1994, Ser. No. 307,370

Claims priority, application France, Sep. 21, 1993, 93 11208

Int. Cl.[6] G02F *1/1335*

U.S. Cl. 362—29 3 Claims



1. A lighting module for instruments having a liquid-crystal matrix lying in a plane, said module comprising:

a casing including back and lateral walls wherein the matrix forms a wall of the casing opposite said back wall;

a fluorescent tube disposed in the casing near said back wall; and

a reflective surface shaped to form at least one parabolic cylindrical surface, said cylindrical surface having a focal line and a plane of symmetry, the axis of said fluorescent tube being substantially coaxial with said focal line and the planes of symmetry of said parabolic cylindrical surfaces being inclined with respect to the plane of the said liquid-crystal matrix.

5,486,984

PARABOLIC FIBER OPTIC LUMINAIRE

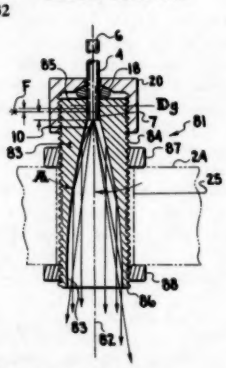
Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Aug. 19, 1991, Ser. No. 746,749

The portion of the term of this patent subsequent to May 20, 2010, has been disclaimed.

Int. Cl.[6] F21V *7/04*

U.S. Cl. 362—32 5 Claims



1. A fiber optic luminaire including:

an elongated fiber optic light guide having a cylindrical diameter, a first end accepting light from a remote source of illumination and a second end emitting light;

a paraboloidal reflector having a focus near a first end of a parabola of revolution about an optical axis and an open second end;

wherein the second end of the elongated fiber optic light guide extends into a first end of the paraboloidal reflector towards the open second end of the paraboloidal reflector to a point whereat the diameter of the elongated fiber optic light guide intersects a paraboloidal surface of the paraboloidal reflector at an angle between 10° and 30° to the optical axis.

5,486,985

ADJUSTING APPARATUS FOR HEADLIGHT REFLECTOR

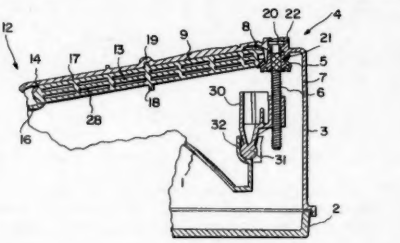
Wolfgang Kemper, Rüthen, and Heiko Briese, Lippstadt, both of, Germany, assignors to Hella KG Hueck & Co., Lippstadt, Germany

Filed Dec. 12, 1994, Ser. No. 354,784

Claims priority, application Germany, Dec. 16, 1993, 43 42 881.9

Int. Cl.[6] B60Q *1/06*

U.S. Cl. 362—69 20 Claims



1. Adjusting apparatus for one or more headlight reflectors by means of which a reflector, which is enclosed in an interior of a housing by a light-transmissive shield, is pivotal about an axis, the adjusting apparatus comprising first and second angled transmission units coupled to one another in the interior of the housing, the first angled transmission unit including a first miter gear mechanism having a toothed-gear pair, with an adjusting pin toothed-gear thereof being coupled to, and rotatable with, an adjusting pin which couples the reflector with a rearward housing wall and with a shaft toothed-gear thereof, which is attached to a rigid shaft being set between the adjusting pin toothed-gear and a bearing box of the rearward housing wall, and the second angled transmission unit being rotatably mounted in an opening of the housing and having a rotatable knob manipulatable from an exterior of the housing;

wherein the second angled transmission unit, which is coupled to the first angled transmission unit by the rigid shaft, comprises a second miter gear mechanism including a shaft toothed-gear attached to the rigid shaft and a rotation-part toothed-gear attached to the rotatable knob; and

wherein said rigid shaft is of rigid material having a first free end coupled to the shaft toothed-gear of the first miter gear mechanism for rotation therewith and a second free end coupled to, and rotatable with, the shaft toothed-gear of the second miter gear mechanism, said rigid shaft extending adjacent the rearward housing wall of the housing on the interior thereof, at least the ends of the shaft having the toothed-gears mounted thereon being in the bearing box of the rearward wall, the bearing box being trough-shaped with the shaft being held radially therein by girding elements for the pin and rotation-part toothed-gears whose teeth interengage with the shaft toothed-gears.

5,486,986

REMOTE CONTROL ILLUMINATED MAGNIFIER

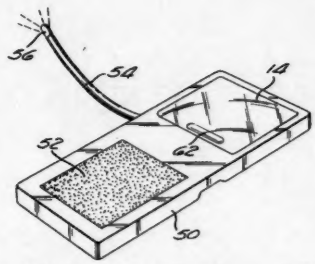
Carla R. Brada, 28072 Via Del Cerro, San Juan Capistrano, Calif. 92675

Filed Mar. 29, 1994, Ser. No. 221,086

Int. Cl.[6] F21V *33/00*

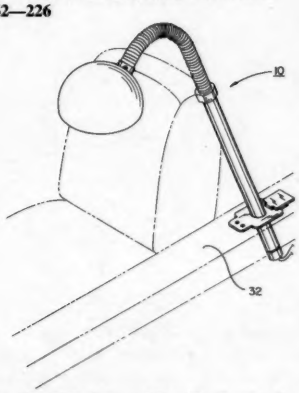
U.S. Cl. 362—85 8 Claims

1. An attachment for a television remote control having a plurality of controls, said attachment comprising:



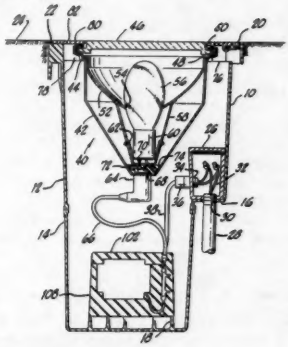
a) a housing having first and second opposed sides thereof attachable to a television remote control;
b) a first light source formed upon a flexible arm attached to said housing; and
c) a second light source formed upon the second side of said housing;
d) wherein said first and second light sources are configured to facilitate substantially simultaneous viewing of said controls and reading of printed matter remote from the television remote control.

5,486,987
BOAT UTILITY LIGHT
Jack D. Fritz, Jr., 9003 Marsh Rd., Plainwell, Mich. 49080-8820
Filed Jan. 5, 1995, Ser. No. 368,969
Int. Cl.[6] H01R *33/00;* **F21V** *21/28*
U.S. Cl. 362—226 **4 Claims**



1. A boat utility light for providing illumination for a fisherman who is fishing under conditions of limited visibility comprising, in combination:
a rigid base further comprising:
a planar cover plate with a top surface, a bottom surface, and a generally petaloid periphery interconnecting the surfaces formed of a front edge, a rear edge, and opposed side edges, a central bore disposed thereon, a first pair of through holes disposed thereon near the front edge, a second pair of through holes disposed thereon near the rear edge and with each through hole sized for receipt of a screw for securing the bottom surface in facing contact with a recipient supporting surface;
a generally rectangular planar cover hingeably coupled to the top surface of the cover plate and positionable in facing contact with the top surface of the cover plate for preventing access through the bore; and
a holding tube having an upper end coupled to the bottom surface of the cover plate in alignment with the bore thereof and a lower end projected angularly downwards therefrom to thereby create an acute angle between the holding tube and the bottom surface of the cover plate;
an elongated rigid linear lamp supporting tube having an upper end and a lower end and with the lower end slidably disposed within the bore of the cover plate and frictionally removably secured within the holding tube;
a lamp socket having a threaded base end, an electrically conductive threaded tip end, and an electrically-energizeable power switch coupled thereto, the power switch having one orientation for allowing electrical energy to be delivered to the tip end and another orientation for preventing such delivery;
a rigid and generally hemispheric light shroud secured about the lamp socket between the ends thereof and with the shroud having a circular opening with a diameter that is about 22% of the length of the lamp supporting tube;
a lamp adjustment tube formed of a piece of flexible tubing secured between the base end of the lamp socket and the upper end of the lamp supporting tube, the lamp adjustment tube having an extended linear length that is about 37% of the length of the lamp supporting tube;
a lamp removably secured within the tip end of the lamp socket within the shroud for providing illumination when electrically energized; and
a pair of electrically conductive wires with each wire having a first end coupled to the power switch and a second end extended through the lamp adjustment tube and lamp supporting tube for coupling with an external source of electrical energy.

5,486,988
LIGHTING SYSTEM
Glenn M. Tyson, La Crescenta, Calif., assignor to GTY Industries, Sylmar, Calif.
Continuation of Ser. No. 177,231, Jan. 4, 1994, Pat. No. 5,408,397, which is a division of Ser. No. 40,295, Mar. 30, 1993, Pat. No. 5,276,583, which is a division of Ser. No. 653,619, Feb. 11, 1991, Pat. No. 5,198,962, which is a division of Ser. No. 389,363, Aug. 3, 1989, Pat. No. 5,041,950. This application Apr. 11, 1995, Ser. No. 419,906
Int. Cl.[6] F21V *31/02*
U.S. Cl. 362—267 **8 Claims**



1. A lighting system comprising
a lamp assembly including a socket enclosure, a lens and a first electrical connector element defining a lamp cavity sealed against moisture from outside of the lamp assembly and against moisture from passing through the first connector element into the lamp cavity;
an electrical circuit including a transformer, an electrical conductor and a second electrical connector element configured to mate with the first electrical connector element;
a potting body impervious to moisture, the transformer being encapsulated in the potting body and sealed against moisture

from around the transformer by the potting body and against moisture from passing through the second connector element to the transformer;

a housing containing the lamp assembly, the electrical circuit and the potting body.

5,486,989

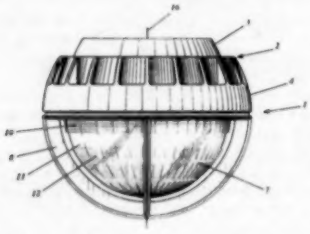
LUMINAIRE WITH MODULAR LOUVER SHIELDS

Wayne W. Compton, Chino Hills, Calif., assignor to Kim Lighting, Inc., City of Industry, Calif.

Filed Nov. 12, 1993, Ser. No. 150,958

Int. Cl.[6] F21V *13/00*

U.S. Cl. 362—291 **28 Claims**



1. A luminaire for lighting a parking garage, comprising

a housing comprising a housing body to protect the luminaire from the elements, and a mounting cap attached to the housing body,

a socket in said housing for receiving a light bulb, to provide light from said luminaire,

a lens attached to said housing to refract said light in a desired vertical and horizontal pattern,

a lens frame positioned around the lens and formed with a plurality of sections, whereby a louver assembly can be removably mounted in each section, and

at least one louver assembly removably mounted with respect to the lens frame and disposed about at least a segment of the lens and arranged to control the vertical flow of light from the luminaire.

5,486,990

LAMP COVER IN PARTICULAR FOR FLUORESCENT LAMPS

Günther Sejkora, Schwarzenberg, Austria, assignor to Zumtobel Licht GmbH, Austria

PCT No. PCT/EP92/00684, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO92/18805, PCT Pub. Date Oct. 29, 1992

PCT Filed Mar. 27, 1992, Ser. No. 133,016

Claims priority, application Germany, Apr. 10, 1991, 9104316 U

Int. Cl.[6] F21V *3/02*

U.S. Cl. 362—309 **11 Claims**

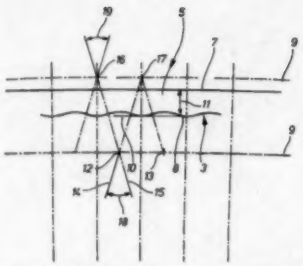
1. A lamp cover particularly for a fluorescent lamp, comprising:

an elongate cover member of light-transmitting material having a longitudinal axis, an outer surface and an inner surface;

one of said inner or outer surfaces of the cover member being of wavelike structure comprising alternating wave peaks and troughs which are oriented substantially parallel to the longitudinal axis of the cover member;

the wavelike structure comprising at least three wave trains and comprising means for expanding a light beam to a predetermined expansion angle;

the light-transmitting material having a refractive index n, the wave train having a tangent with a maximum gradient to a parallel plate at an angle α, and a light beam exiting the cover



member having a half angle γ of ray expansion which satisfies the following relation:

$$\gamma = \arcsin\left[n \cdot \sin\left[\alpha - \arcsin\left(\frac{\sin\alpha}{n}\right)\right]\right]; \text{ and}$$

the wave structure having a half width of 4 mm, a half depth of 0.12 mm, and the light beam exiting the cover member having a half angle of ray expansion of 4°, respectively.

5,486,991

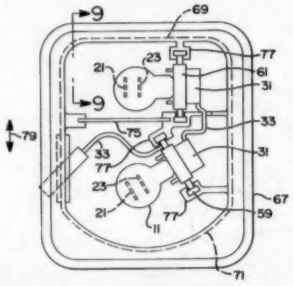
VEHICLE SIGNAL LAMP ASSEMBLY

Jack D. Bodem, Jr., Kokomo, Ind., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jul. 29, 1994, Ser. No. 283,105

Int. Cl.[6] F21V *15/04*

U.S. Cl. 312—369 **8 Claims**



1. A vehicle signal lamp assembly, comprising:

a lamp having a housing that includes a bulb and a base having generally flat opposed major side portions and opposed end portions, at least one pair of relatively stiff filament support wires embedded in said base to extend within the bulb, and a filament supported between the support wires in each said pair of support wires;

a rigid dielectric socket having a cavity receiving said lamp base, said cavity defining a first pair of opposed rigid internal dielectric side wedge surfaces diverging upwardly from a bottom portion of said cavity for engaging and securing said major side portions of said base within said socket, and a second pair of rigid internal dielectric side wedge surfaces for preventing side to side movement of said base within said socket whereby said lamp can be securely plugged into and removed from said socket;

electrical contacts disposed within said cavity and resiliently biased toward said major side portions of said lamp base; and

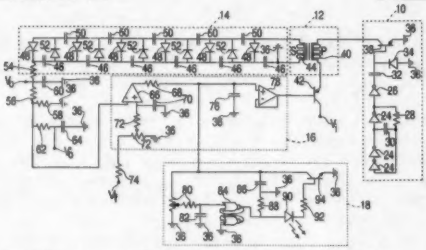
a resilient elastomeric mounting supporting said socket, whereby said socket and associated lamp are partially isolated from vibratory forces exerted through said resilient mounting.

5,486,992

HIGH VOLTAGE DIRECT CURRENT POWER SUPPLY WITH FEEDBACK CONTROL AND CIRCUIT PROTECTION

Thomas E. Koscica, Clark, and William C. Drach, Tinton Falls, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 9, 1995, Ser. No. 370,590
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—21 **8 Claims**



1. A direct current high voltage power supply comprising:

oscillator means for providing a periodic signal output voltage;

transformer means, coupled to the periodic signal output voltage of said oscillator means, for increasing the voltage of the periodic signal output voltage;

multiplier means coupled to an output of said transformer means, for multiplying the voltage at the output of said transformer means;

feedback control means, coupled to a divided portion of an output of said multiplier means, for providing feedback of the output of said multiplier means to said transformer means, wherein said feedback control means includes: a comparator; a variable resistor coupled to an input of said comparator; and a buffer coupled to an output of said comparator; and

protection means, coupled to said feedback control means, for providing short circuit and over-voltage protection,

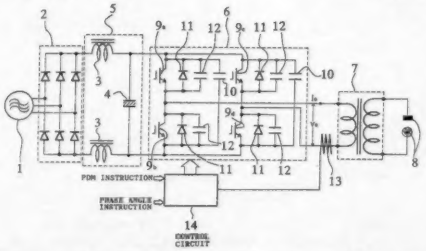
whereby a stable, accurate, protected voltage is obtained.

5,486,993

CONTROLLING APPARATUS FOR HIGH FREQUENCY HIGH VOLTAGE POWER SOURCE FOR CORONA DISCHARGE PROCESSING

Yukihira Sakurai, and Takehiko Ueda, both of Tokyo, Japan, assignors to Kasuga Denki, Incorporated, Tokyo, Japan

Filed Oct. 25, 1993, Ser. No. 140,549
Claims priority, application Japan, Jan. 26, 1992, 4-309823
Int. Cl.[6] H02M *5/44*
U.S. Cl. 363—98 **4 Claims**



1. A controlling apparatus for a high frequency high voltage power source for corona discharge processing of the type wherein an ac voltage from a commercial ac power supply is rectified into a dc voltage by a rectifier circuit and then converted into a voltage of a high frequency, comprising:

a high frequency invertor including a plurality of switching semiconductor elements connected in a bridge connection for converting the rectified voltage into a voltage of high frequency,

a high voltage transformer, having a discharge electrode for corona discharge processing, for boosting the voltage of high frequency and applying the boosted voltage to said discharge electrode, said high voltage transformer and at least said discharge electrode forming a resonance circuit with respect to said high frequency invertor, said controlling apparatus comprising:

current detection means for detecting a current flowing between said high frequency invertor and said high voltage transformer;

a phase locked loop circuit including a phase comparator and a voltage controlled oscillator for outputting a signal having a phase corresponding to the detection current of said current detection means and a frequency corresponding to a voltage of a signal output by said phase comparator;

a pulse density modulation circuit for inputting an output signal of said phase locked loop and thinning out the inputted output signal in accordance with an arbitrary instruction value to output a pulse signal synchronized with the inputted output signal and having a zero voltage outputting period of an arbitrary time length; and

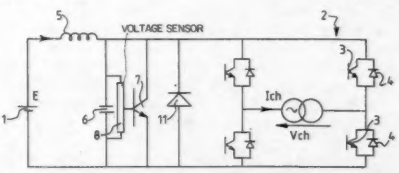
a gate signal generation circuit for inputting the pulse signal from said pulse density modulation circuit and outputting a gate signal to said switching semiconductor elements of said high frequency invertor so that said resonance circuit may be put into and remain in a short-circuited condition within the zero voltage outputting period.

5,486,994

DEVICE FOR CONTROL OF THE OSCILLATING CIRCUIT OF A VOLTAGE INVERTER OPERATING UNDER QUASI-RESONANCE WITH PULSE MODULATION REGULATION

Hervé Pouliquen, and Khaled Elloumi, both of Clamart, France, assignors to Electricite de France-Service National, Paris, France

Filed Mar. 11, 1994, Ser. No. 208,524
Claims priority, application France, Mar. 12, 1993, 93 02898
Int. Cl.[6] H02M *3/24;3/335;7/5387*
U.S. Cl. 363—98 **7 Claims**



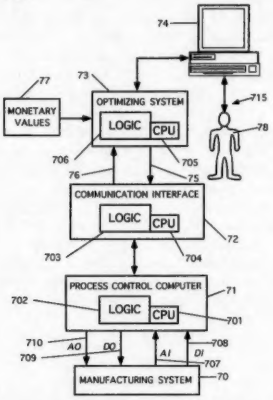
1. Voltage inverter operating under quasi-resonance with pulse width modulation regulation, including a monophase or polyphase bridge (**2**) with controlled components (**3**) operating in blocked/saturated (energizing/de-energizing) mode under control of a control signal, and an oscillating circuit arranged on a DC voltage side and consisting of an inductance (**5**) in series with a DC voltage source (**1**) and a capacitor (**6**) connected in parallel with the controlled-component bridge (**2**), in which pulse width modulation regulation is carried out, a sampling period for which is much greater than a resonance period of the oscillating circuit, characterized in that said inverter includes a switching element (**7**) for sustaining resonance and comprising a plurality of series-connected controlled components (**9**) operating in blocked/saturated mode, said switching element being connected in parallel with the capacitor (**6**) of the oscillating circuit and a voltage sensor (**8**) connected in parallel with the capacitor (**6**) of the oscillating circuit, said resonance switching element (**7**) being controlled by said voltage sensor (**8**) so as to short-circuit the capacitor (**6**) of the oscillating circuit when the voltage across the terminals of the

capacitor is zero and to enable the transitions of the signal for control of the pulse width modulation regulation.

5,486,995
SYSTEM FOR REAL TIME OPTIMIZATION

Johannes H. A. Krist, Terneuzen, Netherlands; Martine R. Lapère, Knokke-Heist, Belgium; Steven G. Wassink, Axel, and Johannes L. A. Koolen, Terneuzen, both of, Netherlands, assignors to Dow Benelux N.V., Netherlands

Filed Mar. 17, 1994, Ser. No. 210,191
Int. Cl.[6] G05B *13/04*
U.S. Cl. 364—149 **43 Claims**



1. In a process control system having first input means, for receiving input signals indicative of measured process attributes in physical process equipment, and output means, for transmitting command signals which include at least one manipulated parameter variable that is used to govern the physical process equipment, an adaptive controller comprising:

second input means for acquiring the monetary value of at least one fluctuating economic variable;

interactive optimization means for determining the value of at least one manipulated parameter variable for said physical process equipment at selected intervals, said interactive optimization means having at least an input signal reconciliation model, for deriving a reconciled input signal set from the input signals, and an optimizing engine means, for converging upon an optimized value for said manipulated parameter variable in response to the reconciled input signal set and the monetary value of at least one fluctuating economic variable; and

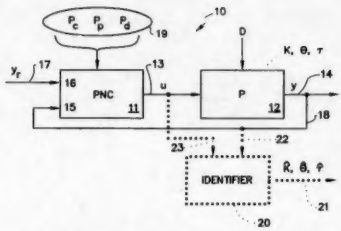
real-time executive means for directing the operation of said interactive optimization means, said real-time executive means having means for periodically transferring at least some of said input signals from said inputs means to said interactive optimization means and means for transferring at least one manipulated parameter variable from said interactive optimization means to said output means.

5,486,996
PARAMETERIZED NEUROCONTROLLERS

Tariq Samad; Wendy K. F. Graber, both of Minneapolis, and Ahmet F. Konar, Circle Pines, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 22, 1993, Ser. No. 8,963
Int. Cl.[6] G05D *13/02*
U.S. Cl. 364—152 **9 Claims**

1. A controller of a process which accepts modification of its behavior through input signals representative of parameters that are



members of a set of parameters including: control parameters p_c, process parameters p_p, and disturbance parameters p_d (which may collectively be called P) wherein said controller comprises a neural network;

wherein the neural network is trained to mimic an existing controller which receives inputs from the set of all P inputs or any subset thereof (except only the subset including only P, I and D inputs), and x_p, y, y_r, u and all algebraic, differential and integral operators of these x_p, y, y_r and u inputs, and has an output in a closed loop use, said training occurring by:

collecting said P parameters, said x_p, y_r, y, u and any other of said inputs as data, and

using said collected data as training data in a learning program which modifies the neural network in a training phase at least until an output from said neural network is similar or identical to the acceptable output generated by said existing controller; wherein:

x_p is dynamic state variables of the process,

y is a process output signal,

y_r is a reference input signal, and

u is a control-adjustment signal and,

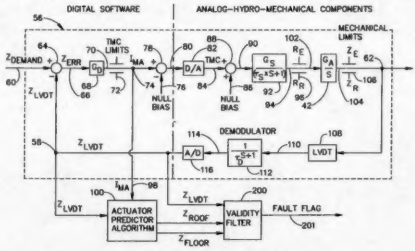
coupling said modified neural network to a second process similar to a first process previously controlled by the existing controller; and

applying said neural network to the second process using inputs that the existing controller would have used to control the first process so that the neural network controls the second process.

5,486,997
PREDICTOR ALGORITHM FOR ACTUATOR CONTROL

Paul R. Reismiller, West Chester, and George A. Brunemann, Jr., Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 4, 1994, Ser. No. 285,836
Int. Cl.[6] G05B *13/02*
U.S. Cl. 364—165 **26 Claims**



1. A control system for an actuator, comprising:

(a) an actuator feedback control for said actuator including:

(i) means for providing a feedback signal indicative of an output position of said actuator;

(ii) means for comparing an output position demand signal for said actuator with said feedback signal for providing an actuator output position error signal; and

(iii) means for providing to said actuator an input signal proportional to said output position error signal; and

(b) a fault detection system including:

(i) an algorithm for continuously determining a maximum limit and a minimum limit for said actuator output position based on a maximum estimated rate of actuator output and a minimum estimated rate of actuator output; and

(ii) means for comparing said feedback signal to said actuator output position maximum and minimum limits and providing a fault indication upon exceeding the bounds thereof.

5,486,998

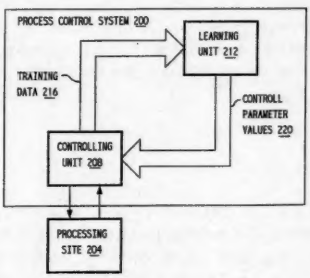
PROCESS STABILIZING PROCESS CONTROLLER

Ronald Corso, Indianapolis, Ind., assignor to Amax Coal West, Inc., Gillette, Wyo.

Filed Jun. 14, 1993, Ser. No. 77,244

Int. Cl.[6] G05B *13/02;* **G06F** *15/18*

U.S. Cl. 364—152 **71 Claims**



1. An automated control processing method comprising the steps of:

conducting a process which is controlled as said process is performed;

establishing, within a learning means, at least one learned relationship between data for at least a first process control parameter for controlling said process, and data for at least a first process influencing factor, said learning means receiving process training data output in said step of conducting;

generating at least a first data cluster, said first data cluster generated from an output of said learning means, said first data cluster including first control data related to said first process control parameter and including first applicability data related to said first process influencing factor for determining when said control data is to be used in controlling said process;

entering said first data cluster into a plurality of stored data clusters, each said data cluster having control data related to said first process control parameter and applicability data related to said first process influencing factor for determining when said control data is to be used in controlling said process;

controlling said process using said first data cluster as an accessed data cluster obtained from said plurality of stored data clusters;

post-filtering said plurality of stored data clusters to retain said first data cluster when used as said accessed data cluster and said process has acceptable performance.

5,486,999

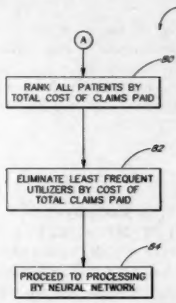
APPARATUS AND METHOD FOR CATEGORIZING HEALTH CARE UTILIZATION

Andrew H. Mebane, 75-683 Hua-ai, Kailua-Kona, Hi. 96740

Filed Apr. 20, 1994, Ser. No. 232,512

Int. Cl.[6] G06F *159/00*

U.S. Cl. 364—401 **9 Claims**


A
RANK ALL PATIENTS BY TOTAL COST OF CLAIMS PAID
ELIMINATE LEAST FREQUENT UTILIZERS BY COST OF TOTAL CLAIMS PAID
PROCEED TO PROCESSING BY NEURAL NETWORK

1. A system to aid in identifying patients potentially seeking inappropriate health care, said system comprising:

a plurality of patient characteristics for a plurality of patients, said patient characteristics representing medical usage and psychological information about said patients; and

a neural network responsive to input variables generated from said plurality of patient characteristics, said neutral network configured to categorize the plurality of patients according to utilization characteristics of said patients based on said input variables, one category of utilization characteristics identifying patients who are potentially seeking inappropriate health care.

5,487,000

SYNTACTIC ANALYSIS APPARATUS

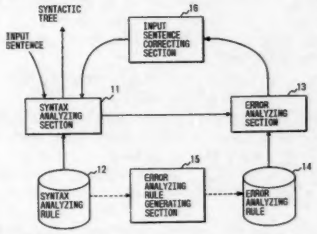
Masanori Takahashi, Yokohama; Tadashi Nagano, Kodaira; Hideko Mori, Kawasaki, and Masaki Kiyono, Ashiya, all of, Japan, assignors to Mitsubishi Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 17, 1994, Ser. No. 197,995

Claims priority, application Japan, Feb. 18, 1993, 5-029361

Int. Cl.[6] G06F *17/27*

U.S. Cl. 364—419.08 **14 Claims**



1. A syntactic analysis apparatus for performing a syntactic analysis of an input sentence according to a given syntax analyzing rule for generating a syntactic tree of the input sentence, said syntactic analysis apparatus comprising:

syntax analyzing means for outputting syntactic subtrees of said input sentence created by said syntax analyzing means up to a time point when said syntax analyzing means fails in said syntactic analysis of said input sentence due to a syntactic error included in said input sentence;

error analyzing means for receiving said syntactic subtrees from said syntax analyzing means and for identifying said syntactic error by applying a given error analyzing rule to said received syntactic subtrees,

error analyzing rule generating means for generating said error analyzing rule by logically inverting said syntax analyzing rule,

said error analyzing rule defining a condition of said syntactic subtrees which represents said syntactic error, wherein said error analyzing rule further defines a correction command for correcting said syntactic error represented by said condition; and

input sentence correcting means responsive to said correction command for correcting said input sentence in accordance with said correction command;

whereby the apparatus identifies and corrects said syntactic error when said condition of the applied error analyzing rule matches said syntactic error.

5,487,001

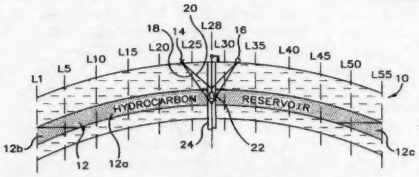
METHOD FOR DETERMINING PETROPHYSICAL PROPERTIES OF A SUBTERRANEAN LAYER

Dennis B. Neff, 2225 Bridget Ct., Bartlesville, Okla. 74006

Filed May 28, 1993, Ser. No. 69,247

Int. Cl.[6] G01V *1/00*

U.S. Cl. 364—421 **10 Claims**



1. A method for determining petrophysical properties of a subterranean layer comprising the computer implemented steps of:

(1) providing at least one reference seismic trace corresponding to at least one reference lateral location and at least one nonreference seismic trace corresponding to at least one nonreference lateral location offset from said at least one reference lateral location, wherein each of the seismic traces results from the detection of the reflection of at least one seismic pulse as generated by at least one seismic source, and wherein each of the seismic traces includes a pair of reflection events respectively corresponding to the upper and lower boundaries of a subterranean layer of interest;

(2) providing a velocity log and a density log, which together comprise a reference log-pair, for the layer at said at least one reference lateral location so as to provide at least one reference-log pair having associated therewith at least one corresponding known value of at least one petrophysical property of the layer;

(3) determining at least one reference reflection coefficient based on said at least one corresponding reference log-pair;

(4) providing at least one, seismic wavelet which is representative of said at least one seismic pulse at the layer and which when convolved with said at least one reference reflection coefficient produces at least one reference synthetic seismogram which approximates said at least one reference seismic trace;

(5) deriving a set of a predetermined number of modified log-pairs, wherein each modified log-pair is different from one another and comprises a velocity log and a density log, each of which logs is a modified version of the respective velocity log and density log of said at least one reference log-pair, and wherein each of the modified log-pairs has associated therewith at least one value of said at least one petrophysical property of the layer which is different than said at least one known value of said at least one petrophysical property and wherein such modified log-pairs are representative of probable variations of said at least one petrophysical property for said at least one nonreference lateral location;

(6) determining a modified reflection coefficient based on the velocity log and density log of each of the modified log-pairs to thereby result in a number of modified reflection coefficients equivalent to the predetermined number of modified log-pairs;

(7) convolving each of the modified reflection coefficients with said at least one seismic wavelet to produce a modified synthetic seismogram for each of the modified reflection coefficients to thereby result in a number of modified synthetic seismograms equivalent to the predetermined number of modified log-pairs, each of the modified synthetic seismograms having reflect ton events corresponding to the upper and lower boundaries of the layer and also having associated therewith at least one value of said at least one petrophysical property associated with the corresponding modified log-pair;

(8) comparing a comparison window of said at least one nonreference seismic trace to a corresponding comparison window of each of the modified synthetic seismograms, where each comparison window includes the reflection events corresponding to the upper and lower boundaries of the layer;

(9) selecting those modified synthetic seismograms which match said at least one nonreference seismic trace sufficiently in step (8) to pass at least one predetermined matching threshold;

(10) assigning to said at least one nonreference seismic trace the values of said at least one petrophysical property corresponding to the respective modified synthetic seismograms selected in step (9), thereby providing a range of values of said at least one petrophysical property associated with said at least one nonreference seismic trace and said at least one corresponding nonreference lateral location of the layer.

5,487,002

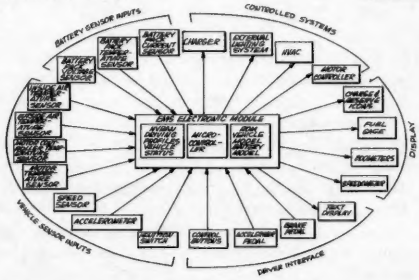
ENERGY MANAGEMENT SYSTEM FOR VEHICLES HAVING LIMITED ENERGY STORAGE

Robert W. Diller, and Jeffrey W. Pavlat, both of Pasadena, Calif., assignors to Amerigon, Inc., Monrovia, Calif.

Filed Dec. 31, 1992, Ser. No. 999,491

Int. Cl.[6] B60K *6/04*

U.S. Cl. 364—424.01 **12 Claims**



1. An energy management system, for vehicles employing a limited energy storage system, comprising:

means for receiving power status data from the energy storage system;

means for storing a plurality of predetermined driving profiles to model expected vehicle performance;

selection means for selection by the driver of one of said driving profiles;

calculation means connected to the receiving means and storage means for calculating range for the limited energy storage system based on the selected driving profile; and,

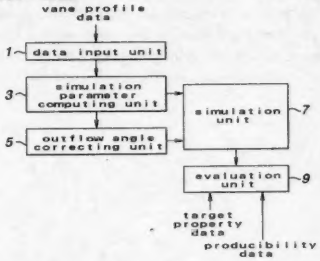
output means to display the range calculation to the driver.

5,487,003

SIMULATION METHOD AND DEVICE FOR AIDING THE DESIGN OF A FLUID TORQUE CONVERTER

Kenjiroh Iwasawa, and Hiroya Abe, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1993, Ser. No. 35,395
Claims priority, application Japan, Apr. 8, 1992, 4-116950
Int. Cl.[6] G06F *19/00;* **F16D** *33/00;* **B60K** *41/12*
U.S. Cl. 364—424.1 **8 Claims**



5. A device for designing a fluid torque converter by simulating properties of the fluid torque converter, comprising:

a data input unit for accepting data on a vane profile of a vane wheel of a fluid torque converter;

a simulation parameter computing unit for computing a plurality of parameters including a fluid passage angle and a fluid passage resistance according to data on said vane profile of said vane wheel supplied from said data input unit;

a fluid passage angle correcting unit for computing a correction value as a function of a slip ratio which is given as a ratio of a pump rotational speed to a turbine rotational speed of said fluid torque converter, and correcting said fluid passage angle computed by said simulation parameter computing unit according to said correction value;

a simulation unit for simulating properties of said fluid torque converter according to said various parameters given from said simulation parameter computing unit, said fluid passage angle corrected by said fluid passage angle correcting unit, and a relationship between input and output torque of said torque converter; and

an evaluation unit for comparing a result of simulation supplied from said simulation unit with a combination of target property data and producibility data, wherein said producibility data is indicative of the suitability of said vane wheel for fabrication, and evaluating the feasibility of said vane profile.

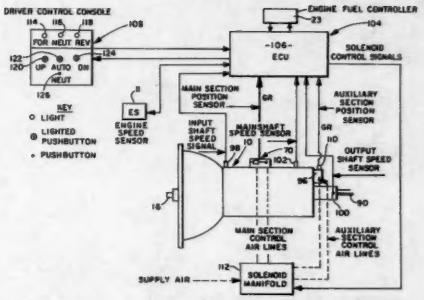
5,487,004

CONTROL SYSTEM/METHOD FOR AUTOMATED MECHANICAL TRANSMISSION SYSTEMS

Marcel Amsallen, Kalamazoo, Mich., assignor to Eaton Corpoaration, Cleveland, Ohio

Filed Oct. 29, 1993, Ser. No. 143,230
Int. Cl.[6] F16H *59/48;* **G06F** *19/00*
U.S. Cl. 364—424.1 **8 Claims**

1. A control system (**104**) for at least partially automatic implementation of selected shifts of a mechanical change gear transmission system comprising a fuel throttle controlled engine (E), a multispeed change gear mechanical transmission (**10**) having an input shaft (**16**) and an output shaft (**90**)and having a plurality of selectably engageable gear ratios, a non-positive coupling (C) driving interposed between the engine and the transmission, a first sensor (**98**) for providing a first input signal (IS) indicative of input shaft rotational speed, a second sensor (**100**) for providing a second input signal (OS) indicative of output shaft rotational speed, a third sensor (**70/110**) for providing a third signal indicative of currently engaged transmission ratio, a non- manually controllable transmission actuator (**112**, **70**, **96**) for controlling shifting of the transmission, and a central processing unit (**106**) for



receiving said first, second and third input signs and for processing same in accordance with predetermined logic rules to select and implement upshifts and downshifts from the currently engaged gear ratio and to issue command output signals to implement said upshifts and downshifts by the sequence of disengaging a first positive clutch and then engaging a second positive clutch, both of said positive clutches comprising a first clutch member (**80**, **82**, **84**) having a rotational speed determined by the rotational speed of the vehicle engine and a second clutch member (**86**, **88**, **90**) having a rotational speed determined by vehicle speed, said shift actuator having a first mode of operation wherein a maximum force is applied for disengaging said first positive clutch; said central processing unit including:

logic rules effective for determining a value equal to a difference between said input signal indicative of input shaft rotational speed and the product of said input signal indicative of output shaft rotational speed multiplied by currently engaged transmission ratio, and if an absolute value of the difference between said first input signal and said product is less than a first reference value ($|IS-(OS*GR)|<REF_1$)corresponding to an expected value of said absolute value in the absence of a fault in said first, second or third input signals, upon sensing a selection of a transmission shift from a currently engaged ratio, for (i) determining a presence or absence of conditions indicative of non-jaw clutch torque lock conditions if said absolute value of said difference is less than a second reference value equal to or less than 10 RPM ($|IS-(OS*GR)|<REF_2 \leqq 10$ RPM); and (ii) for prohibiting issuing command output signals to said transmission actuator to cause disengagement of said currently engaged transmission ratio in said first mode of operation until it is determined that said conditions indicative of non-jaw clutch torque lock conditions are present.

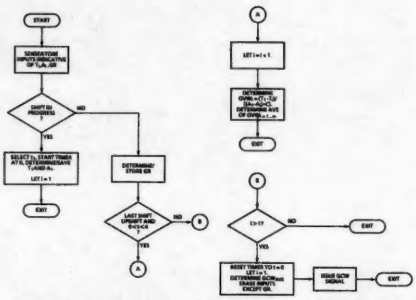
5,487,005

METHOD/SYSTEM FOR DETERMINATION OF GROSS COMBINED WEIGHT OF VEHICLES EQUIPPED WITH ELECTRONIC DATA LINKS

Thomas A. Genise, Dearborn, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 192,522, Feb. 7, 1994. This application Aug. 3, 1994, Ser. No. 285,467
Int. Cl.[6] G06F *19/00;* **G06G** *7/00;* **F16H** *59/48;59/30*
U.S. Cl. 364—424.1 **16 Claims**

1. On a vehicle equipped with an internal combustion engine, a change-gear transmission and an electronic data link carrying information indicative of engine torque, engine speed and vehicle ground speed, a control system for controlling an at least partially automated device separate from the transmission, said control system comprising:



a computing means for receiving input signals and processing same according to predetermined logic rules to issue output signals;

means allowing said computing means to access said data link;

means for sensing completion of shifts in said transmission;

memory means associated with said computing means and containing logic rules to determine, only immediately after completion of a transmission upshift, a value indicative of vehicle gross combined weight (GCW) as a function of information on said data link; and

means for controlling said device as a function of said value.

5,487,006

SYSTEM FOR DETECTING ROAD ROUGHNESS FOR SUSPENSION CONTROL AND AUTOMOTIVE SUSPENSION CONTROL SYSTEM UTILIZING THUS DETECTED ROAD ROUGHNESS AS CONTROL PARAMETER

Shinobu Kakizaki; Minoru Taniguchi, and Fukashi Kanai, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

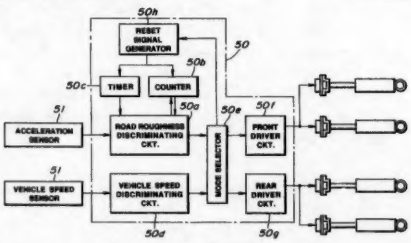
Continuation of Ser. No. 433,151, Nov. 8, 1989, abandoned.

This application Nov. 16, 1993, Ser. No. 152,880

Claims priority, application Japan, Nov. 14, 1988, 63-287072; Nov. 29, 1988, 63-155439 U

Int. Cl.[6] B60G *25/00*

U.S. Cl. 364—424.05 **24 Claims**



3. A system for detecting road conditions comprising:

a lateral G sensor for monitoring lateral acceleration exerted on a vehicular body and for producing a lateral acceleration signal indicative thereof;

means for detecting each occurrence of the lateral acceleration indicative signal having a magnitude greater than a predetermined value and for producing a detection signal each time the magnitude of the lateral acceleration signal is greater than the predetermined value, said predetermined value being set larger than or equal to a maximum value (B) of a bandwidth which has a center that generally corresponds to a zero level of the longitudinal acceleration signal;

means for counting each occurrence of said detection signal over a predetermined period and for providing a counter signal indicative of the counted value over said predetermined period; and

means for comparing the counter signal value with a predetermined threshold value for producing a rough road indicative signal when the counter signal value is greater than or equal to the threshold value, said predetermined threshold value being a first number of times per said predetermined time period which exceeds a second number of times per said predetermined time period by a predetermined amount, said second number of times per said predetermined time period being generally indicative of a rolling motion of the vehicle, and said predetermined amount being selected to separate said first predetermined number from said second number sufficiently to ensure that rolling motion of the vehicle body and rough road conditions can be distinguished from one another.

5,487,007

CONTROL SYSTEM AND CONTROL METHOD FOR CONTROLLING POWER STEERING APPARATUS

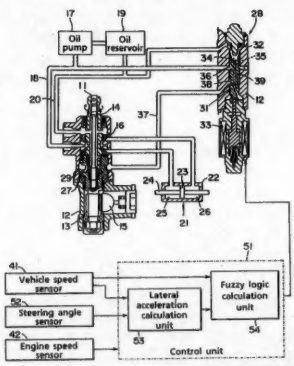
Hidekazu Suzuki, Aichi; Mitsuhiko Harara, and Tadao Tanaka, both of Okazaki, all of, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1994, Ser. No. 251,951

Claims priority, application Japan, Jun. 1, 1993, 5-130363

Int. Cl.[6] B62D *6/00*

U.S. Cl. 364—424.05 **12 Claims**



1. A control system for a power steering apparatus which controls a steering assist amount of a steering mechanism of a vehicle to coincide with a target steering assist amount, comprising:

vehicle speed detection means for detecting a vehicle speed;

lateral acceleration detection means for determining a lateral acceleration acting upon-the vehicle; and

a controller for receiving the detected vehicle speed as a first input factor and setting a first target amount which is decreased according to an increase in the detected vehicle speed, for receiving a product of the detected vehicle speed and the determined lateral acceleration as a second input factor and setting a second target amount which is decreased according to an increase in the product, and for setting the target steering assist amount according to the first target amount and the second target amount.

5,487,008

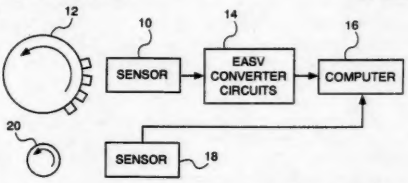
METHOD AND SYSTEM FOR DETECTING THE MISFIRE OF A RECIPROCATING INTERNAL COMBUSTION ENGINE IN FREQUENCY DOMAIN

William B. Ribbens, Ann Arbor, and Jaehong Park, Rochester, both of Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 512,779, Apr. 20, 1990, Pat. No. 5,200,899, and a continuation-in-part of Ser. No. 741,338, Aug. 21, 1991, Pat. No. 5,239,473, and a continuation-in-part of Ser. No. 759,397, Sep. 13, 1991, Pat. No. 5,278,760. This application Feb. 26, 1993, Ser. No. 23,342

Int. Cl.[6] G06F *19/00;* **F02P** *5/00;* **G01L** *3/26*

U.S. Cl. 364—431.04 **10 Claims**



1. A method for detecting a misfire of a reciprocating internal combustion engine including a plurality of reciprocating components having an engine cycle frequency, N cylinders and a crankshaft, the method comprising the steps of:

generating an electrical signal as a function of crankshaft angular velocity, the electrical signal containing data;

sampling the data synchronously with crankshaft angular position at a sampling rate to obtain sampled data;

transforming the sampled data to an equivalent frequency domain spectrum, including frequency components having complex amplitudes at the engine cycle frequency and harmonics thereof; and

applying an algorithm to the magnitudes of the frequency components, which algorithm distinguishes between a true misfire and normal cycle variability which characterizes the combustion process in each cylinder of the engine to thereby obtain a misfire signal and wherein the method further comprises the step of shifting the sampled data for (N-1) of the cylinders prior to the step of transforming to identify the cylinder in which the misfire occurred.

5,487,009

METHOD FOR DETERMINING THE COURSE OF A LAND VEHICLE BY COMPARING SIGNALS FROM WHEEL SENSORS WITH SIGNALS OF A MAGNETIC SENSOR

Heidebrecht Hill, Remchingen Noe, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE91/00856, § 371 Date May 5, 1993, § 102(e) Date May 5, 1993, PCT Pub. No. WO92/08953, PCT Pub. Date May 29, 1992

PCT Filed Nov. 5, 1991, Ser. No. 50,228

Claims priority, application Germany, Nov. 7, 1990, 40 35 370.2

Int. Cl.[6] G06F *15/50;* **G01C** *21/20*

U.S. Cl. 364—449 **11 Claims**

1. A method for correcting a course of a land vehicle in a navigation system wherein a driving distance and course changes are derived from wheel pulses generated by sensors in the course of revolution of wheels of a vehicle axle by respectively a preset angle, wherein the course changes derived from the wheel pulses are compared with comparison course changes which are detected with the aid of a magnetic sensor, and wherein correction factors are derived from the result of the comparison and stored, the method comprising the steps of:

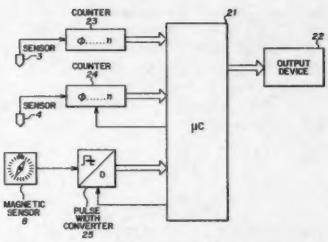
observing the course changes and the comparison course changes over the course of an observation course driven by the vehicle, such that the observation course is greater at higher vehicle speeds than at lower vehicle speeds,

calculating a difference between the course changes and the comparison course changes during course changes over said observation course which are greater than a preset minimum value,

changing said stored correction factors to provide changed, stored correction factors, as follows:

increasing said stored correction factors if the course changes are less than the comparison course changes, and

reducing the stored correction factors if the course changes are greater than the comparison course changes.



5,487,010

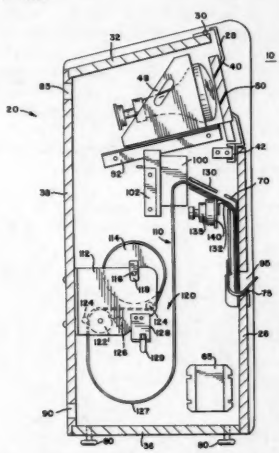
BUMPER STICKER PRINTING MACHINE

Charles S. Drake, Norcross, Ga.; Bernhard O. Williams, Elmhurst, Ill.; Adrian T. Dombrowski, Remington, Ind., and Athur R. Harth, Chicago, Ill., assignors to B.M.D., Inc., Norcross, Ga.

Filed Jun. 25, 1993, Ser. No. 81,116

Int. Cl.[6] G06F *17/60*

U.S. Cl. 364—479 **20 Claims**



18. A bumper sticker printing machine for printing bumper stickers selected by a user through interaction with said machine, said machine comprising:

a machine housing;

a synthetic bumper sticker stock mounted in said housing;

interaction means for allowing said user to design said bumper stickers, said interaction means mounted in said housing;

means for printing mounted in said housing, said means for printing including means for pulling said bumper sticker stock therethrough during printing; and

a feed mechanism for forming a free hanging loop in said bumper sticker stock between said stock and said means for printing, said feed mechanism including a motorized pinch

roller, associated guide rollers mounted proximate said pinch roller, a spring loaded lever cooperatively associated with said pinch roller, and a switch for activating said pinch roller, said means for pulling contracting said loop during printing, the contracting loop contacts and raises an arm of said switch to engage said switch, thereby operating said motorized pinch roller to create a new loop.

5,487,011

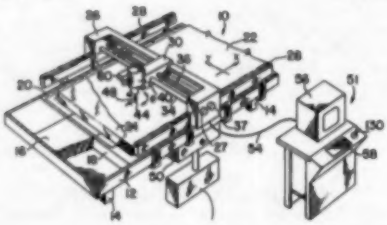
GARMENT MARKER SYSTEM HAVING COMPUTER ASSISTED ALIGNMENT OF VARIABLE CONTRAST CLOTH DESIGNS

Craig L. Chaiken, Spring, Tex., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Mar. 17, 1994, Ser. No. 210,303

Int. Cl.[6] **G06F** *19/00;* **G05B** *19/18;* **G06K** *9/00;* **G01N** *21/84*

U.S. Cl. 364—470 **20 Claims**



52

8. A method for aligning a garment segment pattern at a selected location in a marker with a high contrast geometric design in a fabric web on an upper surface of a table in a system having a moveable video sub-system including a camera having an array of pixel elements configured to receive light from a portion of the fabric web and provide electrical signal equivalents thereof; said method comprising the steps of:

receiving marker signals including garment segment pattern signals and a reference signal corresponding to a reference location in said marker of said fabric design and camera pixel element alignment therewith;

receiving, from said camera video sub-system signals including signals corresponding to said fabric web design at said reference location;

receiving, from said camera video sub-system signals including signals corresponding to said fabric web design at a match location;

generating, for said reference location and said match location signals, signals corresponding to respective low resolution images including the steps of:

configuring a blurring pixel array corresponding to a subset of a plurality of pixel element positions centered about a given pixel element;

assigning a weighting value for each of said pixel array subset element positions;

computing, for each of said reference and match image pixel signals, a weighted pixel signal value corresponding the sum of the product of the pixel intensity value for each pixel and the corresponding weighting value divided by the number of element positions in said array subset;

computing minimum and maximum signal values for said low resolution reference and match images;

computing a magnitude range for said low resolution reference and match images;

calculating signals corresponding to a scaling factor for said low resolution reference and match images;

computing, with said scale factor, scaled low resolution reference and match image signals;

configuring, for said low resolution reference and match images, respective computational pixel arrays corresponding to a first central subset of a pixel element positions, including;

dividing each pixel row of said first computational pixel arrays into a plurality of row segments;

computing an average pixel intensity value for each of said row segments;

dividing each pixel column of said computational pixel arrays into a plurality of column segments;

computing an average pixel intensity value for each of said column segments;

generating, for each of said row segments, previous row transition signals corresponding to a difference between average intensity values for a current one of said row segments and a corresponding row segment in a previous row;

generating previous row transition difference signals corresponding to a difference between each corresponding one of said previous row transition signals in said match and image first computational pixel arrays;

generating, for each of said row segments, subsequent row transition signals corresponding to a difference between average intensity values for said current one of said row segments and a corresponding row segment in a subsequent column;

generating subsequent row transition difference signals corresponding to a difference between each corresponding one of said subsequent row transition signals in said match and image first computational pixel arrays;

generating, for each of said column segments, previous column transition signals corresponding to a difference between average intensity values for a current one of said column segments and a corresponding column segment in a previous column;

generating previous column transition difference signals corresponding to a difference between each corresponding one of said previous column transition signals in said match and image first computational pixel arrays;

generating, for each of said column segments, subsequent column transition signals corresponding to a difference between average intensity values for said current one of said column segments and a corresponding column segment in a subsequent column;

generating subsequent row transition difference signals corresponding to a difference between each corresponding one of said subsequent row transition signals in said match and image first computational pixel arrays;

generating signals indicative of a first sum of said column segment and said row segment transition differences;

configuring, for said match image, a computational pixel array corresponding to a second, non-centered, subset of pixel element positions, including;

dividing each pixel row of said second computational pixel arrays into a plurality of row segments;

computing an average pixel intensity value for each of said row segments;

dividing each pixel column of said second computational pixel arrays into a plurality of column segments;

computing an average pixel intensity value for each of said column segments;

generating, for each of said row segments, previous row transition signals corresponding to a difference between average intensity values for a current one of said row segments and a corresponding row segment in a previous row;

generating previous row transition difference signals corresponding to a difference between each corresponding one of said previous row transition signals in said match and image second computational pixel arrays;

generating, for each of said row segments, subsequent row transition signals corresponding to a difference between average intensity values for said current one of said row segments and a corresponding row segment in a subsequent column;

generating subsequent row transition difference signals corresponding to a difference between each corresponding one of said subsequent row transition signals in said match and image second computational pixel arrays;

generating, for each of said column segments, previous column transition signals corresponding to a difference between average intensity values for a current one of said column segments and a corresponding column segment in a previous column;

generating previous column transition difference signals corresponding to a difference between each corresponding one of said previous column transition signals in said match and image second computational pixel arrays;

generating, for each of said column segments, subsequent column transition signals corresponding to a difference between average intensity values for said current one of said column segments and a corresponding column segment in a subsequent column;

generating subsequent row transition difference signals corresponding to a difference between each corresponding one of said subsequent row transition signals in said match and image second computational pixel arrays;

generating signals indicative of a second sum of said column segment and said row segment transition differences; and

generating signals selecting as a match the one of said match computational arrays corresponding to the lowest of said first and second sums.

5,487,012

METHOD OF PREPARING AN OTOPLASTY OR ADAPTIVE EARPIECE INDIVIDUALLY MATCHED TO THE SHAPE OF AN AUDITORY CANAL

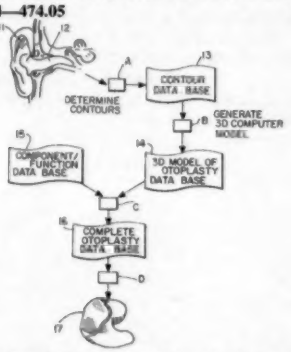
Jan Topholm, Holte; Svend V. Andersen, Espergaerde, and Soren E. Westermann, Hellerup, all of, Denmark, assignors to Topholm & Westermann APS, Vaerloese, Denmark

Continuation of Ser. No. 920,561, Aug. 19, 1992, abandoned. This application Oct. 12, 1994, Ser. No. 322,039

Claims priority, application Germany, Dec. 21, 1990, 40 41 105.2

Int. Cl.[6] G06F *19/00;* **G05B** *19/4097;* **G06T** *17/00*

U.S. Cl. 364—474.05 **38 Claims**



1. A method for computer-controlled production of otoplasties or adaptive earpieces comprising at least one part which is individually matched to contours of an auditory canal, said method comprising the steps of:

tracing of the contours of the auditory canal to obtain contour data, digitization of the contour data and storage of the digitized values;

converting the digitized values into a multi-dimensional computer model of the external contours of the otoplasty or adaptive earpiece; and

automatically or interactively selecting the components/functions for the interior of the computer model while simultaneously defining the wall thickness and optimizing the positions of the components/functions with respect to optimum function, position and minimum bulk.

5,487,013

SYSTEM AND METHOD FOR READING OPERATING PARAMETERS INTO AN OPERATIONALLY READY PROXIMITY SWITCH

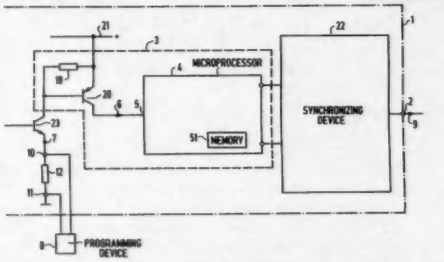
Ernst Luber, Neukirchen, Germany, assignor to Siemens Aktiengesellschaft, München, Germany

Continuation of Ser. No. 893,436, Jun. 4, 1992, abandoned. This application Mar. 10, 1995, Ser. No. 402,756

Claims priority, application European Pat. Off., Jun. 13, 1991, 91109720

Int. Cl.[6] G08B *21/00;* **H03K** *17/945*

U.S. Cl. 364—480 **21 Claims**



1. A system for loading operating parameters into a microprocessor of a prefabricated proximity switch, comprising:

an overcurrent detection device including said microprocessor;

a programming device which simulates an overcurrent condition across a switching output of the proximity switch by generating a pulse corresponding to the simulated overcurrent condition, wherein the generated pulse represents information about at least one of said operating parameters in a bit pattern form and wherein the generated pulse is received by said overcurrent detection device;

an enabling input of said proximity switch which receives synchronizing pulses;

a synchronizing device synchronizing said microprocessor in response to said synchronizing pulses received by said enabling input of said proximity switch; and

an input of said microprocessor which receives said pulse generated by said programming device and received by said overcurrent detection device in response to said synchronizing pulses received by said synchronizing device from said enabling input of the proximity switch to load the bit pattern form information about at least one of the operating parameters into the microprocessor.

5,487,014

LOW COST AUTOMATED SYSTEM FOR EVALUATING THE ELECTRICAL CHARACTERISTICS OF FERROELECTRIC MATERIALS

William C. Drach, Tinton Falls; Richard W. Babbitt, Fair Haven, and Thomas E. Koscica, Clark, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1994, Ser. No. 296,824

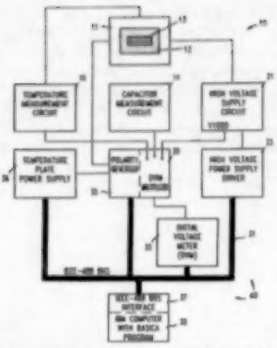
Int. Cl.[6] G01R *1/00*

U.S. Cl. 364—481 **4 Claims**

1. A low-cost automated system for measuring the electrical characteristics of a ferroelectric material, comprising:

a fixture having a temperature plate upon which the ferroelectric material is placed, said temperature plate having a temperature sensor positioned thereon directly beneath the ferroelectric material;

a computer controlled measuring circuit electrically connected to the ferroelectric material and said fixture for applying a predetermined range of temperature and electric potential to said ferroelectric material, and for automatic and simultaneous measurement of the electrical characteristics of the ferroelectric material at each said predetermined temperature and electrical potential;



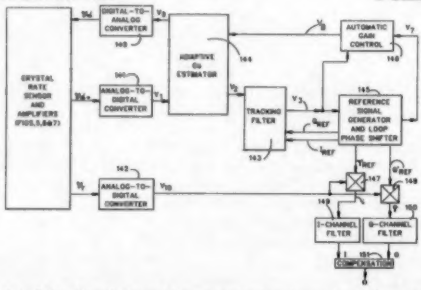
said computer controlled measuring circuit having a computer with a IEEE-488 Interface, an IEEE-488 Bus electrically coupled to said IEEE-488 Interface, a temperature plate power supply electrically coupled to said computer through said IEEE-488 Bus, a digital voltmeter electrically coupled to said computer through said IEEE-488 Bus, a high voltage power supply driver electrically coupled to said computer through said IEEE-488 Bus, a multiplexor and a polarity reverser electrically coupled to said computer through said IEEE-488 Bus, a temperature measuring circuit electrically coupled to said multiplexer and said fixture, a capacitor measuring circuit electrically coupled to said multiplexer and said fixture, a high voltage power supply electrical coupled to said high voltage power supply driver, said multiplexer and said fixture, said polarity reverser electrically connected to said temperature plate, said power supply and said fixture.

5,487,015

SELF-OSCILLATING DRIVER CIRCUIT FOR A QUARTZ RESONATOR OF AN ANGULAR RATE SENSOR

Stanley A. White, San Clemente, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 13, 1993, Ser. No. 119,637
Int. Cl.[6] G01R *25/04*
U.S. Cl. 364—484 **6 Claims**



4. A drive circuit for exciting a resonator at a resonant frequency of said resonator, said resonator having a pair of terminals, said drive circuit comprising:

(a) an adjustable phase shifter connected in a feedback loop including said resonator for adjusting a phase shift of a periodic signal circulating in said feedback loop; and

(b) a phase detector responsive to phase shift across said terminals and connected to said phase shifter for adjusting said phase shifter for obtaining a phase shift of said periodic signal of approximately zero across said terminals; and

(c) an adaptive circuit connected to said adjustable phase shifter and said phase detector for canceling a component of said periodic signal passing through shunt capacitance of said resonator between said terminals, wherein said adaptive circuit includes:

(1) a test oscillator connected in said feedback loop for exciting said resonator with a test signal;

(2) a multiplier connected to said adaptive circuit for generating a cancellation signal proportional to said periodic signal and a shunt capacitance estimating signal;

(3) a combiner connected in said feedback loop and connected to said multiplier for canceling said component of said periodic signal passing through said shunt capacitance of said resonator; and

(4) a shunt capacitance estimator connected to said combiner and said multiplier for adjusting said shunt capacitance estimating signal in order to minimize the presence of said test signal passing in said feedback loop from said combiner by the steps of:

(A) multiplying an estimate of the shunt capacitance by the test signal to produce a product signal;

(B) scaling and delaying the product signal to produce the cancellation signal;

(C) demodulating the combined signal by the test signal produce a residual;

(D) calculating the difference between:

(1) a scaled and delayed residual and

(2)the sum of a delayed residual and a double delayed residual;

(E) increasing the estimate of shunt capacitance if the difference is positive; and

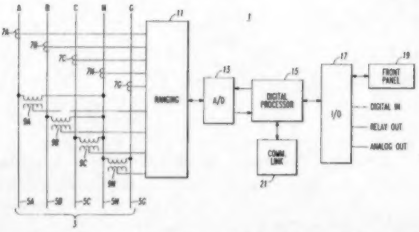
(F) decreasing the estimate of shunt capacitance if the difference is negative.

5,487,016

APPARATUS FOR GENEARTING A SIGNAL REPRESENTATIVE OF TOTAL HARMONIC DISTORTION IN WAVEFORMS OF AN A/C ELECTRICAL SYSTEM

Robert T. Elms, Monroeville, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 4, 1994, Ser. No. 334,506
Int. Cl.[6] G01R *23/00*
U.S. Cl. 364—484 **7 Claims**



1. Apparatus for generating a signal representative of total harmonic distortion in an ac waveform having a fundamental frequency, said apparatus comprising:

sensing means generating a sensed signal representative of said ac waveform;

means generating from said sensed signal a fundamental signal representative of a fundamental frequency component of said sensed signal;

means generating a harmonics signal as a difference between said sensed signal and said fundamental signal; and

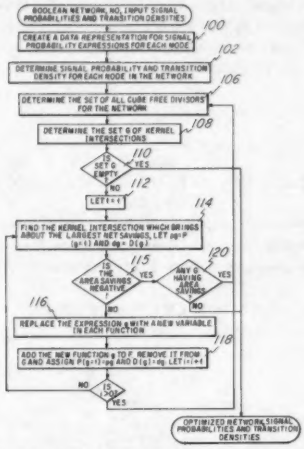
means generating a total harmonic distortion signal from said fundamental signal and said harmonics signal.

5,487,017

CIRCUIT ACTIVITY DRIVEN MULTILEVEL LOGIC OPTIMIZATION FOR LOW POWER RELIABLE OPERATION

Sharat Prasad, Dallas, and Kaushik Roy, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 18, 1993, Ser. No. 18,984
Int. Cl.[6] H03M 5/00
U.S. Cl. 364—488 **14 Claims**


BOOLEAN NETWORK, NO. INPUT SIGNAL PROBABILITIES AND TRANSITION DENSITIES
100
CREATE A DATA REPRESENTATION FOR SIGNAL PROBABILITY EXPRESSIONS FOR EACH NODE
102
DETERMINE SIGNAL PROBABILITY AND TRANSITION DENSITY FOR EACH NODE IN THE NETWORK
106
DETERMINE THE SET OF ALL CUBE FREE DIVISORS FOR THE NETWORK
108
DETERMINE THE SET G OF KERNEL INTERSECTIONS
110
IS SET G EMPTY?
YES
NO
112
LEVEL=1
114
FIND THE KERNEL INTERSECTION WHICH BRINGS ABOUT THE LARGEST NET SAVINGS, LET pg=P (g=1) AND dg= D(g)
115
IS THE AREA SAVINGS NEGATIVE
YES
120
ANY G HAVING AREA SAVINGS
YES
NO
116
REPLACE THE EXPRESSION g WITH A NEW VARIABLE IN EACH FUNCTION
118
ADD THE NEW FUNCTION g TO F. REMOVE IT FROM G AND ASSIGN P(g=1)=pg AND D(g)=dg. LET i=i+1
NO
IS G= NULL
YES
OPTIMIZED NETWORK, SIGNAL PROBABILITIES AND TRANSITION DENSITIES

1. A method for optimizing a boolean network having a plurality of functions, a plurality of inputs and a plurality of nodes, comprising the steps of:

a. locating any cube-free divisors in the boolean network which apply to at least two of said plurality of functions;

b. selecting the greatest divisor, wherein said greatest divisor is the cube-free divisor which brings about the largest net savings and wherein the net savings comprises both an area savings component and a power savings component;

c. replacing the greatest divisor with a variable in each of said plurality of functions so as to enable further optimization; and

d. adding said variable to said boolean network to create an optimized boolean network.

5,487,018

ELECTRONIC DESIGN AUTOMATION APPARATUS AND METHOD UTILIZING A PHYSICAL INFORMATION DATABASE

Joann Loos, Palo Alto; Chao-Yuan Wang, Newark, and Mossaddeg Mahmood, San Jose, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Aug. 13, 1993, Ser. No. 106,104
Int. Cl.[6] G06F 17/50
U.S. Cl. 364—489 **20 Claims**

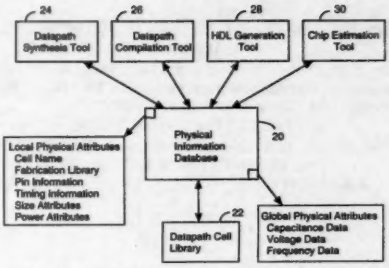
11. A method of analyzing a circuit specification corresponding to a desired functional operation, said method comprising the steps of:

providing a datapath cell library including a plurality of circuit elements that may be selected to implement said desired functional operation;

operating a plurality of electronic design automation tools, including at least one synthesis tool and at least one analysis tool, to process said circuit specification;

constructing a shared physical information database with information corresponding to said plurality of circuit elements; and

using said plurality of electronic design automation tools to analyze said circuit specification, wherein at least one synthesis tool and at least one analysis tool access common information in said shared physical information database.

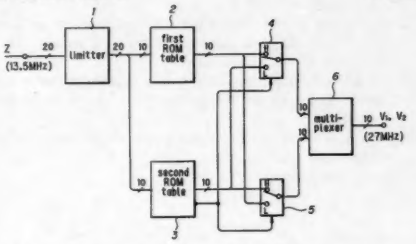


5,487,019

DIGITAL DATA TRANSFER METHOD

Motomu Ueta, and Tetsuya Harada, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1994, Ser. No. 219,708
Claims priority, application Japan, Mar. 31, 1993, 5-094992
Int. Cl.[6] G06F 17/00
U.S. Cl. 364—514 R **4 Claims**



1. A method for transferring (N*m) bit depth data Z for digital image processing apparatus using an m-bit digital data transfer format, N being a positive integer greater than or equal to 2, M being a number of values representable by m bits of digital data first K sequential values starting from a lowest of the M values of the m-bit digital data being forbidden codes in the m-bit digital data transfer format which are reserved for control information and information other than image data, and L values within the M values of the m-bit digital data being forbidden codes in the m-bit digital data transfer format, comprising the steps of:

(a) dividing the (N*m) bit depth data Z into N items of m-bit digital data V_1 to V_N, where

$$Z = \Sigma_{n=1}^{N} \{(M-L)^{n-1}(V_n - K)\} \text{ and}$$
$$Z = (M-L)^{N-1}(V_N - K) + (M-L)^{N-2}(V^{N-1} - K) + (M-L)^{N-3}(V_{N-2} - K) + \ldots + (M-L)(V_2 - K) + (V_1 - K);$$

(b) transmitting the m-bit digital data V_1 to V_N obtained in step (a) along with control information and information other than picture data using the m-bit digital data transfer format;

(c) receiving the transmitted m-bit digital data V_1 to V_N; and

(d) restoring the received m-bit digital data V_1 to V_N to a form of the (N*m) bit depth data Z based on the equation

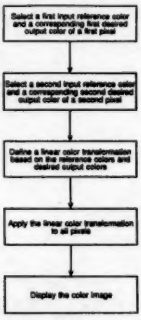
$$Z = \Sigma_{n=1}^{N} \{(M-L)^{n-1}(V_n - K)\}.$$

5,487,020

REFINEMENT OF COLOR IMAGES USING REFERENCE COLORS

Timothy Long, West Pymble, Australia, assignor to Canon Information Systems Research Australia PTY Ltd., N. Ryde, Australia, and Canon Inc., Tokyo, Japan

Filed Jan. 12, 1994, Ser. No. 180,295
Claims priority, application Australia, Jan. 18, 1993, PL6840
Int. Cl.[6] H04N *9/64*; G03F *3/00*
U.S. Cl. 364—571.01 **3 Claims**


Select a first input reference color and a corresponding first desired output color of a first pixel
Select a second input reference color and a corresponding second desired output color of a second pixel
Define a linear color transformation based on the reference colors and desired output colors
Apply the linear color transformation to all pixels
Display the color image

1. A method for color correcting a predetermined portion of a color image, said color image comprising a plurality of pixels and a plurality of color information channels for each of said plurality of pixels, said method comprising the steps of:

selecting in said predetermined portion a first input reference color of a first pixel and a corresponding first desired output color of the first pixel;

selecting in said predetermined portion a second input reference color of a second pixel and a corresponding second desired output color of the second pixel;

defining a linear color transformation for each color information channel based on the input reference colors and the desired output colors;

applying said linear color transformation to all pixels in said predetermined portion; and

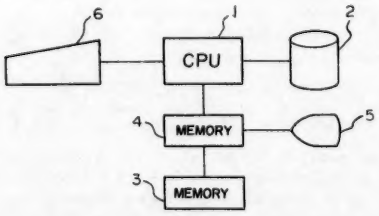
displaying the color image.

5,487,021

COMPUTER-AIDED DESIGN SYSTEM

Shigehisa Fujita, and Kenji Sato, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1993, Ser. No. 84,073
Claims priority, application Japan, Jun. 30, 1992, 4-173522
Int. Cl.[6] G06F *17/00*
U.S. Cl. 364—578 **11 Claims**



1. A computer-aided design system comprising:

storage means for storing computer-aided design data of a plurality of parts of an object;

display means, coupled to said storage means, for displaying image data corresponding to said computer-aided design data;

operation means for performing plotting and drawing of said plurality of parts of said object in accordance with values input to said operation mean by a system user; and

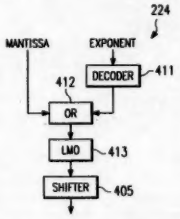
control means, operatively coupled to said storage means, said display means and said operation means, for reading from said storage means said computer-aided design data of said plurality of parts of said object, combining image data corresponding to said computer-aided design data, displaying said combined image data on said display means, calculating clearances between said plurality of parts of said combined image data displayed on said display means in accordance with said input values, and displaying said clearances on said combined image data as contour lines.

5,487,022

NORMALIZATION METHOD FOR FLOATING POINT NUMBERS

Richard Simpson, Carlton, United Kingdom; Erick D. Oakland, Zavalla, Tex., and Graham M. Barr, Raunds, United Kingdom, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 8, 1994, Ser. No. 207,992
Int. Cl.[6] G06F *7/38*
U.S. Cl. 364—715.04 **6 Claims**



1. A floating point normalization circuit receiving a mantissa part and an exponent part of a floating point number, the exponent part having a minimum expressible exponent, said circuit comprising:

an exponent decoder receiving the exponent part of the floating point number and generating a coded multibit output corresponding to a maximum decrease in the exponent part of the floating point number within the minimum expressible exponent, said exponent decoder including

a two to four line decoder for each pair of bits of the exponent part of the floating point number, and

an AND gate connected to selected outputs of said two to four line decoders for each bit of said mantissa;

a bit-wise OR circuit connected to said exponent decoder, receiving the mantissa part of the floating point number and said coded multibit output and forming a logical OR output of each bit of the mantissa part with a corresponding bit of said coded multibit output;

a left most one circuit connected to said bit-wise OR circuit detecting a bit position of a most significant bit of said logical OR output having a "1";

a left shifter circuit connected to said left most one circuit and receiving the mantissa part of the floating point number, said left shifter left shifting the mantissa part the floating point number an amount equal to said detected bit position of a most significant bit having a "1"; and

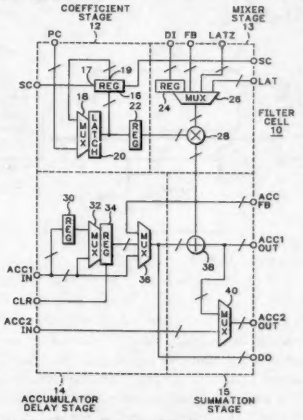
a decrementer connected to said left most one circuit and receiving the exponent part of the floating point number, said decrementer decrementing the exponent part of the floating point number an amount equal to said detected bit position of a most significant bit having a "1".

5,487,023

REPEATABLE FINITE AND INFINITE IMPULSE RESPONSE INTEGRATED CIRCUIT STRUCTURE

Michael C. Seckora, Gales Creek, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Feb. 14, 1994, Ser. No. 194,963
Int. Cl.[6] G06F *17/10*
U.S. Cl. 364—724.13 **23 Claims**



1. A repeatable filter cell comprising:

a coefficient input stage having at least two coefficient inputs for receiving respective input coefficients, a means for selecting one of the input coefficients, and a coefficient output for providing the selected coefficient as output of the coefficient input stage,

a mixer stage having at least two data value inputs for receiving respective input data values, a means for selecting one of the input data values, a multiplier means for receiving the selected coefficient from the coefficient input stage and the selected input data value and multiplying the selected input data value by the selected coefficient to form a mixer stage product, and a product output for providing the mixer stage product as output of the mixer stage,

an accumulator delay stage having at least one input for receiving at least one input accumulation value, a selectively variable delay means for imposing a selected delay on the input accumulation value, and an accumulation delay output for providing the selectively delayed input accumulation value as output of the accumulator delay stage, and

a summation stage having an input for receiving the accumulator delay stage output, an input for receiving the mixer stage output, a means for summing the accumulation value and the mixer stage output, and a summation stage output for providing the sum of the accumulation value and the mixer stage output as output of the filter cell.

5,487,024

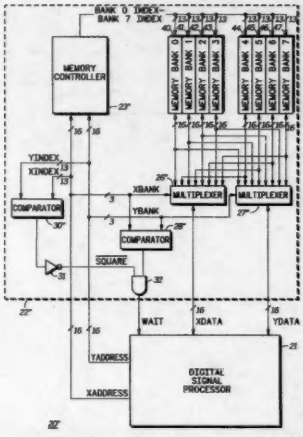
DATA PROCESSING SYSTEM FOR HARDWARE IMPLEMENTATION OF SQUARE OPERATIONS AND METHOD THEREFOR

James W. Girardeau, Jr., Toulouse, France, assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 677,919, Apr. 1, 1991, abandoned. This application Nov. 15, 1993, Ser. No. 152,075
Int. Cl.[6] G06F *7/552*
U.S. Cl. 364—753 **13 Claims**

1. A data processing system comprising:

a data processor coupled to first and second data paths and to first and second addresses corresponding thereto, respectively, each of said first and second addresses having a first portion



and a second portion, said data processor delaying an access to said second data path in response to a wait signal being active;

first and second memory portions;

multiplex means coupled to said first and second memory portions and to said first and second data paths, for multiplexing data from said first memory portion onto either said first or said second data path in response to said first portion of said first address, and from said second memory portion onto either said first or said second data path in response to said first portion of said second address; and

logic means coupled to said data processor, for activating said wait signal if both, said first portion of said first address and said first portion of said second address are equal, and, said second portion of said first address and said second portion of said second address are unequal, and for keeping said wait signal inactive if, said first portion of said first address and said first portion of said second address are equal and said second portion of said first address and said second portion of said second address are equal.

5,487,025

CARRY CHAIN ADDER USING REGENERATIVE PUSH-PULL DIFFERENTIAL LOGIC

Hamid Partovi, Westboro, Mass., and Donald A. Draper, San Jose, Calif., assignors to Intergraph Corporation, Huntsville, Ala.

Filed Nov. 15, 1993, Ser. No. 152,561
Int. Cl.[6] G06F *7/50*
U.S. Cl. 364—788 **2 Claims**

1. A circuit for adding binary numbers comprising:

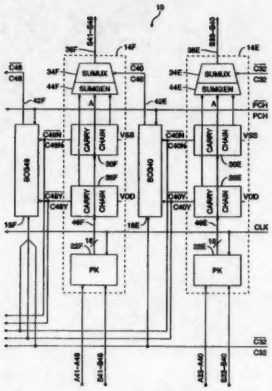
a carry indicating circuit for generating a carry-in signal indicating whether the addition of a first plurality of bits of the binary numbers to be added results in a carry;

a first carry chain circuit connected to the carry indicating circuit for generating a first carry-out signal indicating whether the addition of a second plurality of bits of the binary numbers to be added together with a carry from the addition of the first plurality of bits of the binary numbers to be added results in a carry;

a second carry chain circuit connected to the carry indicating circuit for generating a second carry-out signal indicating whether the addition of the second plurality of bits of the binary numbers to be added without a carry from the addition of the first plurality of bits of the binary numbers to be added results in a carry; and

wherein the first and second carry chain circuits each include:

a first transistor connected to a second transistor so that the first and second transistors may be initially biased in a noncon-



ducting state when a first node is at a first voltage potential and a second node is at a second voltage potential, the first voltage potential being different from the second voltage potential; and

altering means for altering the voltage potential at the first and second nodes and for causing the first and second transistors to be in a conducting state and for accelerating the voltage change at the first and second nodes to final voltage potentials; and

selection circuitry, coupled to the carry indicating circuit and to the first and second carry chain circuits, for selecting either the first carry-out signal or the second carry-out signal in response to the carry-in signal.

5,487,026

MULTIPLYING DEVICE, LINEAR ALGEBRAIC PROCESSOR, NEUROMORPHIC PROCESSOR, AND OPTICAL PROCESSOR

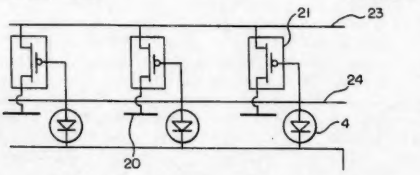
Michael G. Robinson, Stadhampton, United Kingdom, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 10, 1993, Ser. No. 28,834

Claims priority, application United Kingdom, Mar. 10, 1992, 9205161

Int. Cl.[6] G06G *7/16*

U.S. Cl. 364—841 **22 Claims**



1. A multiplying device comprising an electro-optical emitter which emits optical radiation as a function of a first input signal, an opto-electric transducer, and a controllable attentuator having controllable non-volatile attenuation to optical radiation as a function of a second input signal and being disposed between the emitter and the transducer such that the opto-electric transducer provides an output signal representative of a multiplication of the first and second input signals.

5,487,027

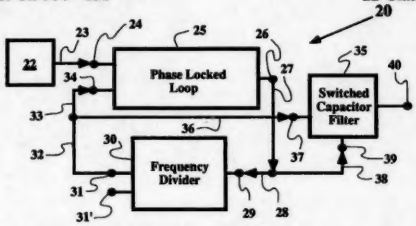
PROCESS AND APPARATUS FOR PROVIDING AN ANALOG WAVEFORM SYNCHRONIZED WITH AN INPUT SIGNAL

Michael C. Heath, and Steve C. Southward, both of Cary, N.C., assignors to Lord Corporation, Cary, N.C.

Filed May 18, 1994, Ser. No. 245,719

Int. Cl.[6] G06G *7/16*; G06J *1/00*

U.S. Cl. 364—851 **22 Claims**



1. A waveform generator, comprising:

(a) a phase-locked loop having a first phase-locked loop input for receiving an input signal from a source, a second phase-locked loop input, and a phase-locked loop output for outputting a multiplied square wave signal whose frequency is a multiple of a frequency of said input signal from said source;

(b) a frequency divider having a frequency divider input for receiving said multiplied square wave signal from said phase-locked loop, a frequency divided output including at least one divided output signal, one of said at least one divided output signal being received by said second phase-locked loop input of said phase-locked loop; and

(c) a first switched-capacitor filter having a first clock input for receiving said multiplied square wave signal from said phase-locked loop, a first switched-capacitor filter input of said first switched-capacitor filter for also receiving one of said at least one divided output signal, and a switched-capacitor filter output for outputting a first analog wave which is synchronized to said input signal from said source.

5,487,028

METHOD FOR ARRANGING COLUMN DECODERS IN A VIDEO RAM

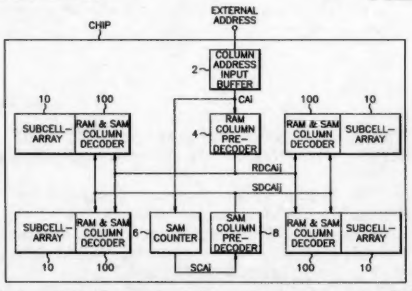
Sei S. Yoon, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 22, 1994, Ser. No. 279,171

Claims priority, application Rep. of Korea, Jul. 31, 1993, 1993-14845

Int. Cl.[6] G11C *5/02*

U.S. Cl. 365—51 **8 Claims**



1. A method of arranging column decoders in a video RAM, comprising the steps of:

dividing a memory cell array into a plurality of memory sub-cell arrays, each memory sub-cell array having a plurality of memory cells arranged in columns and rows;

arranging the plurality of memory sub-cell arrays around centrally located peripheral circuits including a predecoder; and,

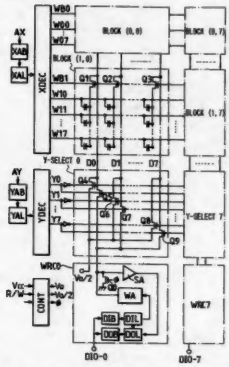
arranging a column decoder to one side of each memory sub-cell array between the memory sub-cell array and the peripheral circuits, each column decoder comprising a RAM column decoder section and a SAM column decoder section.

5,487,029

SEMICONDUCTOR MEMORY DEVICE HAVING A NON-VOLATILE MEMORY COMPOSED OF FERROELECTRIC CAPACITORS WHICH ARE SELECTIVELY ADDRESSED

Kenichi Kuroda, Tachikawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 24, 1993, Ser. No. 111,507
Claims priority, application Japan, Aug. 27, 1992, 4-252326
Int. Cl.[6] G11C *11/22*
U.S. Cl. 365—145 **30 Claims**



1. A semiconductor memory device comprising a first unit memory block, a second unit memory block and a first data line,

wherein said first unit memory block comprises:

a first sub-data line;

a first address selecting line;

a second address selecting line;

a third address selecting line;

a first switch coupled between said first data line and said first sub-data line, said first switch having a control terminal coupled to said first address selecting line;

a first ferroelectric capacitor coupled between said second address selecting line and said first sub-data line; and

a second ferroelectric capacitor coupled between said third address selecting line and said first sub-data line, and

wherein said second unit memory block comprises:

a second sub-data line;

a fourth address selecting line;

a fifth address selecting line;

a sixth address selecting line;

a second switch coupled between said first data line and said second sub-data line, said second switch having a control terminal coupled to said fourth address selecting line;

a third ferroelectric capacitor coupled between said fifth address selecting line and said second sub-data line; and

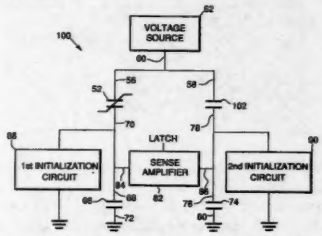
a fourth ferroelectric capacitor coupled between said sixth address selecting line and said second sub-data line, each of said first through fourth ferroelectric capacitors having a pair of electrodes to be electrically coupled to a corresponding address selecting line and a corresponding sub-data line, respectively.

5,487,030

FERROELECTRIC INTERRUPTIBLE READ MEMORY

John J. Drab, Encitas, and O. Glenn Ramer, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 26, 1994, Ser. No. 296,836
Int. Cl.[6] G11C *11/22*
U.S. Cl. 365—145 **8 Claims**



1. A memory, comprising:

a ferroelectric capacitor having a minimum ferroelectric capacitance;

a reference capacitor in parallel arrangement with the ferroelectric capacitor, the reference capacitor having a capacitance greater than the minimum ferroelectric capacitance of the ferroelectric capacitor;

means for writing controllably different saturation polarization states into the ferroelectric capacitor using a single input signal;

means for sensing the difference in capacitance of the ferroelectric capacitor and the reference capacitor, the means for sensing causing only a partial switching in the polarization state of the ferroelectric capacitor when the ferroelectric capacitor is in a state of capacitance greater than the reference capacitor and no change in the polarization state of the ferroelectric capacitor when the ferroelectric capacitor is in a minimum capacitance state, the means for sensing leaving the capacitance of the ferroelectric capacitor greater than that of the reference capacitor; and

means to restore the original ferroelectric polarization of the ferroelectric capacitor following operation of the means for sensing.

5,487,031

THREE-DIMENSIONAL FERROELECTRIC INTEGRATED CIRCUIT HAVING INSULATION LAYER BETWEEN MEMORY LAYERS

Bruce E. Gnade, Rowlett; Russell F. Pinizzotto, Dallas, and Christopher L. Littler, Denton, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 954,211, Sep. 30, 1992, Pat. No. 5,375,085. This application Sep. 26, 1994, Ser. No. 311,806
Int. Cl.[6] G11C *11/22*
U.S. Cl. 365—145 **11 Claims**

1. A ferroelectric integrated circuit comprising:

a base layer;

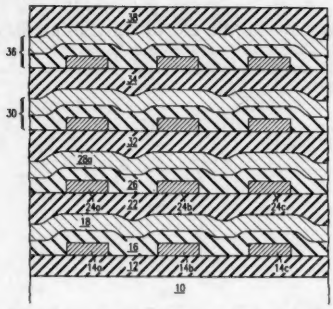
a plurality of memory cell layers formed overlying said base layer, each of said plurality of memory cell layers including:

a first layer of conducting lines;

a ferroelectric layer overlying said first layer of conducting lines;

a second layer of conducting lines overlying said ferroelectric layer, wherein each of said conducting lines of said second layer is substantially perpendicular to said conducting lines of said first layer; and

a plurality of areas of said ferroelectric layer between intersecting conducting lines in said first and second layers capable of being polarized by potentials placed on said intersecting conducting lines in said first and second layers; and



a plurality of inter-layer insulating layers, each of said inter-layer insulating layers interleaved between successive memory cell layers, wherein polarization of a particular area of said plurality of areas in said memory cell layers is capable of causing polarization of other areas proximate to said particular area.

5,487,032

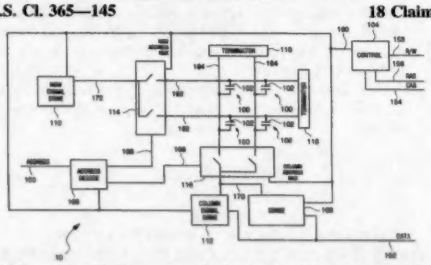
METHOD AND APPARATUS FOR REDUCED FATIGUE IN FERROELECTRIC MEMORY ELEMENTS

Takashi Mihara, Saitama; Hitoshi Watanabe, Tokyo; Hiroyuki Yoshimori, Kanagawa, all of, Japan; Carlos A. Paz de Araujo, and Larry D. McMillan, both of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo., and Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1994, Ser. No. 338,003

Int. Cl.[6] G11C *11/22*

U.S. Cl. 365—145 **18 Claims**



1. In a non-volatile memory device having at least one ferroelectric memory element within at least one memory cell, wherein a polarization state of said ferroelectric memory element is associated with a stored logic "1" and another polarization state of said ferroelectric memory element is associated with a stored logic "0", a method for reducing polarizability fatigue of said ferroelectric memory element comprising the steps of:

receiving a request to coerce the state of polarization of said ferroelectric memory element to a desired state of polarization;

generating, responsive to said request, a waveform electric field signal having a directional polarity and having a maximum amplitude sufficient to alter said state of polarization of said ferroelectric memory element, said signal having a predetermined rise time, during which the amplitude of said signal changes from a first level to said maximum amplitude, wherein said predetermined rise time is selected from the group comprising, about one half the plate rise time of said ferroelectric memory element, and about one half the sense delay time of said ferroelectric memory element; and

applying, responsive to said request, said signal to said ferroelectric memory element such that the state of polarization of said ferroelectric memory element is coerced to said desired state of polarization.

5,487,033

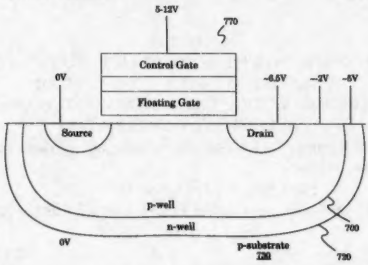
STRUCTURE AND METHOD FOR LOW CURRENT PROGRAMMING OF FLASH EEPROMS

Stephen N. Keeney, Sunnyvale, and Gregory E. Atwood, San Jose, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 28, 1994, Ser. No. 267,815

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—185.19 **18 Claims**



8. A low current method for programming a cell of an electrically erasable programmable read only memory (EEPROM), said EEPROM comprising at least one cell, each cell having a floating gate, a control gate, a source junction and drain junction, said method comprising the steps of:

placing the cells in a first well which is contained in a second well in a substrate;

applying a gate voltage to the control gate of the cell;

applying a drain voltage to the drain junction of the cell, said drain voltage set to cause hot electron injection of electrons onto the floating gate;

applying a first well bias voltage to the first well, the first well bias voltage to eliminate the need for applying a source bias voltage; and

applying a second well bias voltage to the second well.

5,487,034

SEMICONDUCTOR MEMORY DEVICE AND METHOD FOR WRITING DATA THEREIN

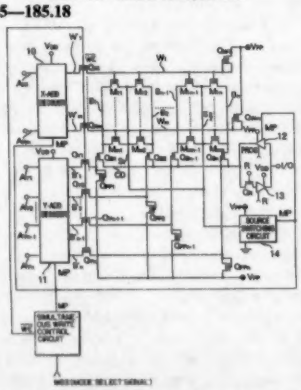
Tatsuro Inoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 308,342

Claims priority, application Japan, Sep. 27, 1993, 5-239710

Int. Cl.[6] G11C *7/00;11/409*

U.S. Cl. 365—185.18 **9 Claims**



5. A semiconductor memory device comprising: a semiconductor substrate; a plurality of memory transistors arrayed in rows and columns on said semiconductor substrate, said memory transistors each having a source and a drain regions, a floating gate and a control gate electrode; a word line disposed for each row of said

memory transistors and connected to each control gate electrode of corresponding row of said memory transistors; a bit line disposed for each column of said memory transistors and connected to each said drain region of corresponding column of said memory transistors; a source line disposed for each pair of columns of said memory transistors and connected to each said source region of corresponding one of said memory transistors; a word line selection circuit for selecting at least one said word line to apply a first positive voltage thereto relative to said semiconductor substrate; a bit line selection circuit for selecting at least one bit line to apply a second positive voltage thereto relative to said semiconductor substrate, said second voltage being lower than said first voltage; a simultaneous-selection control circuit for controlling said word line selection circuit and said bit line selection circuit to simultaneously select a plurality of said word lines and a plurality of said bit lines; and a switching circuit for applying said second positive voltage to each said source line corresponding to each of the selected bit lines in response to the selective operation of the simultaneous selection control circuit.

5,487,035

METHOD OF MULTIPLEXED DATA READING/WRITING SUITABLE FOR VIDEO-ON-DEMAND SYSTEM

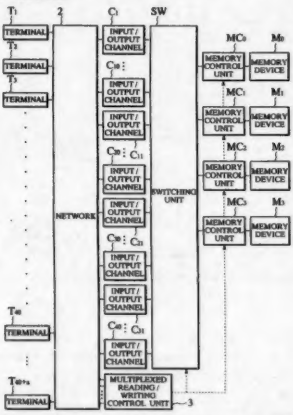
Kazutoshi Nishimura, Tokyo; Hideki Sakamoto, Saitamaken, and Hideharu Suzuki, Tokyo, all of, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 296,725

Claims priority, application Japan, Aug. 26, 1993, 5-234218

Int. Cl.[6] H04Q *11/04*; G11C *7/00*

U.S. Cl. 365—189.02 **8 Claims**



1. A method of multiplexed data reading/writing with respect to a plurality of memory devices through m memory control means connected to the memory devices and m×n input/output channels selectively connected to said m memory control means via switching means, where m and n are integers greater than one, the method comprising the steps of:

(a) dividing each data into a plurality of segment data and storing the segment data of each data in a prescribed order among the memory devices;

(b) connecting said m memory control means with said m×n input/output channels selectively and sequentially by the switching means in units of time-slots such that each of said m memory control means is connected with each of said m×n input/output channels at least once within a prescribed period; and

(c) carrying out the reading/writing operations of the segment data stored by the step (a) in the memory devices by making accesses from said m memory control means in parallel at each time-slot such that each segment data read/written by each of said m memory control means from/into one of the memory devices connected thereto at each time-slot is transmitted to/from one of said m×n input/output channels connected by the step (b) thereto at each time-slot.

5,487,036

NONVOLATILE SEMICONDUCTOR MEMORY

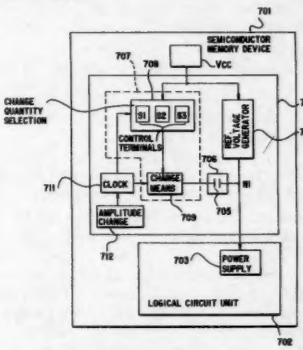
Takao Akaogi; Masanobu Yoshida, both of Kawasaki; Yasushige Ogawa, Kasugai; Yasushi Kasa, and Shouichi Kawamura, both of Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 996,942, Dec. 28, 1992. This application Jul. 6, 1994, Ser. No. 268,580

Claims priority, application Japan, Dec. 27, 1991, 3-346663; May 28, 1992, 4-137080; Jul. 20, 1992, 4-191793; Sep. 17, 1992, 4-248023; Jan. 9, 1992, 4-271869; Jan. 13, 1992, 4-274355; Dec. 3, 1992, 4-324302; Dec. 4, 1992, 4-325544

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—189.09 **9 Claims**



1. A nonvolatile semiconductor memory having a matrix (1) of nonvolatile erasable memory cells (Mij) formed at intersections of word lines (WL1 to Wlm) and bit lines (BL11 to BL1K, . . . , Bln1 to Blnk), a row decoder (3), a column decoder (5), and sense amplifiers (7) connected to the bit lines (BL11 to BL1k, . . . , Bln1 to Blnk), respectively, the nonvolatile semiconductor memory involving a plurality of read modes requiring different source voltages, the nonvolatile semiconductor memory comprising:

a source voltage input portion;

reference voltage generation means connected to said source voltage input portion;

boost means, connected to said source voltage input portion and said reference voltage generation means, including a capacitance element; and

charging quantity changing means, connected to said boost means, for changing a charge quantity of said capacitance element in several levels according to different voltages required for said read modes, and said charge quantity changing means including charging means for charging said capacitance element.

5,487,037

PROGRAMMABLE MEMORY AND CELL

Robert D. Lee, Denton, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

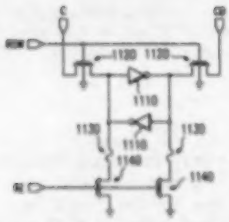
Continuation of Ser. No. 352,142, May 15, 1989, Pat. No. 4,995,004. This application Feb. 19, 1991, Ser. No. 657,717

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—189.11 **1 Claim**

1. An integrated circuit convertible memory cell, comprising:

(a) a bistable element having two states;



(b) a programmable clamp which when both programmed and activated puts said bistable element into a fixed one of said two states;

(c) a control node connected to said programmable clamp, with activation of said programmable clamp controlled by a signal on said control node, wherein;

(d) said bistable element includes two inverters with an output of each of said two inverters connected to an input of another of said two inverters;

(e) said programmable clamp includes for each of said inverters a fuse and a switch in series between said output and ground; and

(f) said signal on said control node controls said switches.

5,487,038

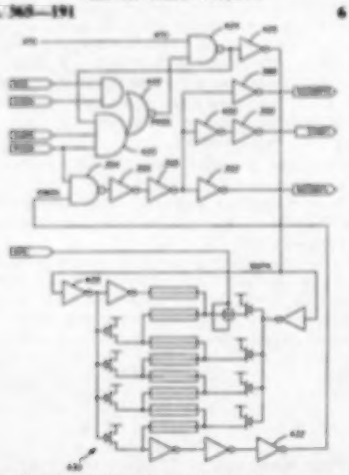
METHOD FOR READ CYCLE INTERRUPTS IN A DYNAMIC READ-ONLY MEMORY

James A. Komarek, Newport Beach; Clarence W. Padgett, Westminster; Scott B. Tanner, Irvine, all of Calif.; Shin-ichi Kojima, Amagasaki, Japan; Jack L. Mimay; Motohiro Ohshi, both of Irvine, Calif.; Keiji Fukumura, and H. Nakanishi, both of Hyogo, Japan, assignors to Creative Integrated Systems, Inc., Santa Ana, Calif., and Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 15, 1994, Ser. No. 290,549

Int. Cl.[6] **G11C** *7/00;8/00*

U.S. Cl. 365—191 **6 Claims**



1. A method for clocking the read cycle of a memory to avoid address skew errors comprising the steps of:

receiving a first one of a plurality of sample address control signals, (SMPA.), indicating an input address change;

generating a primary clock signal, (START), in response to receipt of said first one of said sample address signals, (SMPA), said clock signal, (START), having a predetermined time duration;

maintaining said primary clock signal, (START), active for a duration long enough to provide adequate precharge time for said memory given variations in supply voltage, temperature and manufacturing process variation and further to permit adequate discharge time for the address word line in said memory even when driven high in a previous memory cycle so that a precharge phase of said memory is begun;

receiving a second one of said plurality of sample address signals, (SMPA); and

continuing said precharge phase of said memory notwithstanding receipt of said second one of said sample address signals, (SMPA), by virtue of setting said primary clock signal, (START), signal high for said predetermined time period after receipt of each one of said plurality of sample address signals, (SMPA),

whereby address skew errors are avoided.

5,487,039

SEMICONDUCTOR MEMORY DEVICE

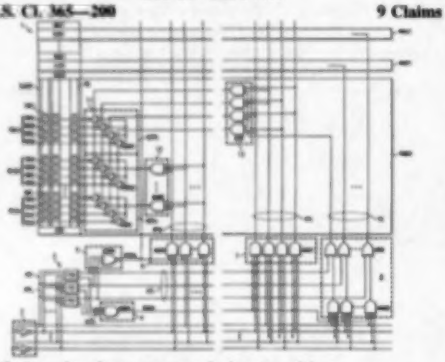
Shunichi Sukegawa, Oumo, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 28, 1993, Ser. No. 69,221

Claims priority, application Japan, May 28, 1992, 4-162244

Int. Cl.[6] **G11C** *7/00*

U.S. Cl. 365—200 **9 Claims**



1. A semiconductor memory device comprising:

an array of memory cells made up of a plurality of subarrays of memory cells;

each of said subarrays of memory cells being arranged in a matrix of rows and columns of individual memory cells;

spare sets of redundant memory cells corresponding to at least some of said subarrays of memory cells;

address generating means for providing an address signal to selectively drive one of the row and column of memory cells included in a subarray of memory cells;

sets of short circuit elements for selecting a spare set of redundant memory cells from any one of the spare sets of redundant memory cells regardless of which subarray of memory cells corresponds thereto instead of the selected one of the row and column of memory cells included in a subarray of memory cells when said selected one of the row and column of memory cells included in the subarray of memory cells contains at least one defective memory cell;

redundancy enable generating means responsive to the detection of an address corresponding to a defective memory cell for producing a redundancy enable signal; and

sets of spare drivers corresponding to said spare sets of redundant memory cells, a respective set of spare drivers responsive to a redundancy enable signal from said redundancy enable generating means for selectively driving a spare set of redundant memory cells in accordance with a selection status of said sets of short circuit elements.

5,487,040

SEMICONDUCTOR MEMORY DEVICE AND DEFECTIVE MEMORY CELL REPAIR CIRCUIT

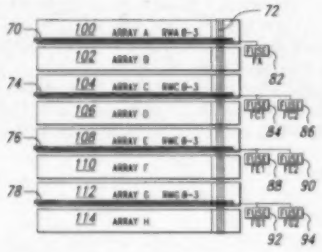
Shunichi Sukegawa, Oume, and Tetsuya Saeki, Tachikawa, both of, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex., and Hitachi Ltd., Japan

Filed Jul. 12, 1993, Ser. No. 90,848

Claims priority, application Japan, Jul. 10, 1992, 4-207332

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—200 **6 Claims**



1. A semiconductor memory device comprising:

a plurality of memory blocks, each of said memory blocks having an array of memory cells provided thereon arranged in a matrix of rows and columns of individual memory cells

each array of memory cells including a main array sector of rows and columns of memory cells as part of a regular memory configuration, at least some of the arrays of memory cells including a redundant group of a plurality of one of the rows and columns of memory cells as redundant memory;

a plurality of redundant group selection lines corresponding in number to the plurality of said one of the rows and columns of memory cells included in each of said redundant groups;

the plurality of said one of the rows and columns of memory cells included in each of said redundant groups having a first redundant address of a portion only of the number of address bits to be provided on an address signal line for addressing memory cells of the regular memory configuration;

a first plurality of programmable fuses respectively connected to an address signal line;

a redundant memory address group decoder for selecting one redundant group of a plurality of said one of the rows and columns of memory cells in response to the first redundant address defined by said portion of the address bits provided on the address signal line;

a second plurality of programmable fuses respectively connected to the address signal line; and

a redundant memory address decoder for selecting a portion of a selected one redundant group in response to a second redundant address having a number of address bits constituting all of the address bits as provided on the address signal line to define the address of a memory cell.

5,487,041

SEMICONDUCTOR MEMORY DEVICE WHICH CAN BE PROGRAMMED TO INDICATE DEFECTIVE MEMORY CELL

Tomohisa Wada, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 309,823

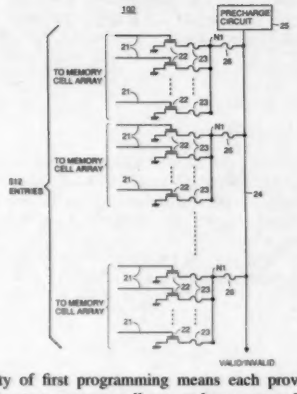
Claims priority, application Japan, Jan. 25, 1993, 5-265934

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—200 **8 Claims**

1. A cache memory device for increasing the operating speed of a cache memory comprising:

a plurality of cache memory cell arrays each including a plurality of memory cell rows, each of said plurality of memory cell rows including a plurality of memory cells;



a plurality of first programming means each provided corresponding to a memory cell row and programmed to indicate whether the corresponding memory cell row is defective or not; and

a plurality of second programming means each provided corresponding to a memory cell array and programmed to indicate whether the corresponding cache memory cell array is defective or not.

5,487,042

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE EQUIPPED WITH ANSWER SYSTEM FOR TEACHING OPTIONAL FUNCTIONS TO DIAGNOSTIC SYSTEM

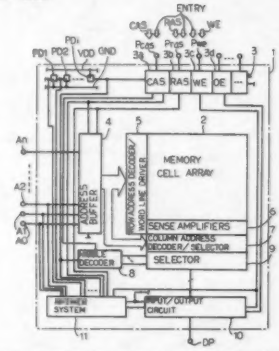
Yasuhiro Edo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 3, 1994, Ser. No. 205,101

Claims priority, application Japan, Mar. 4, 1993, 5-043435

Int. Cl.[6] G11G *7/00*

U.S. Cl. 365—201 **6 Claims**



1. A semiconductor integrated circuit device fabricated on a single semiconductor chip and selectively entering into a standard mode and a diagnostic mode, comprising:

a) a main functional circuitry for achieving tasks through one of optional sub-modes of said standard mode of operation selected by a user, said main functional circuitry being subjected to a test operation in said diagnostic mode;

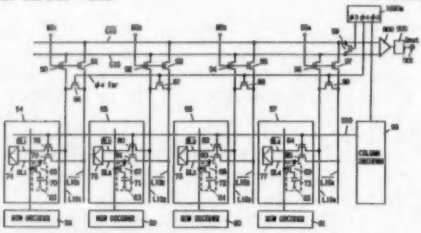
b) a signal source operative to fix mode signals respectively indicative of said optional sub-modes of operation selectively to an active level representative of selection of said user and an inactive level representative of non-selection of said user, the mode signal of said active level establishing the optional sub-mode selected by said user in said main functional circuitry; and

c) an answer system enabled in said diagnostic mode, and responsive to an inquiry signal from a diagnostic system for sequentially supplying said mode signals to said diagnostic system.

5,487,043
SEMICONDUCTOR MEMORY DEVICE HAVING EQUALIZATION SIGNAL GENERATING CIRCUIT

Kiyohiro Furutani; Tadaaki Yamauchi, and Makiko Aoki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1994, Ser. No. 306,098
Claims priority, application Japan, Sep. 17, 1993, 5-231701
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—203 5 Claims



1. A semiconductor memory device, comprising:

first and second signal lines juxtaposed and extending respectively in a predetermined direction for receiving potentials corresponding to data from a memory cell;

a plurality of signal line pairs provided along said predetermined direction, each pair extending perpendicularly to said predetermined direction and consisting of a third signal line corresponding to said first signal line and a fourth signal line corresponding to said second signal line, in which the third and fourth signal lines are connected to corresponding first and second signal lines via connecting means for carrying out connection and disconnection in response to a connection signal;

amplifying means for receiving potentials on said first and second signal lines, and outputting read data which attains a first level when the potential on said first signal line is higher than that on said second signal line by at least a first predetermined voltage and which attains a second level when the potential on said first signal line is lower than that on said second signal line by at least a second predetermined voltage;

equalize signal generating means for receiving a write signal which attains a third level at the time of data reading and changes from said third level to a fourth level at the time of data writing and an address signal, and outputting a first equalize signal having two levels which changes from a fifth level to a sixth level in response to said write signal changing from said fourth level to said third level to hold the sixth level for a predetermined period and which attains said fifth level at the time of data reading, and a second equalize signal which changes from a seventh level to an eighth level in response to the change of said address signal when said write signal is at said third level, changes from said seventh level to said eighth level in response to the change of said address signal at the time of data writing, and changes from said eighth level to said seventh level in response to said write signal changing from said fourth level to said third level;

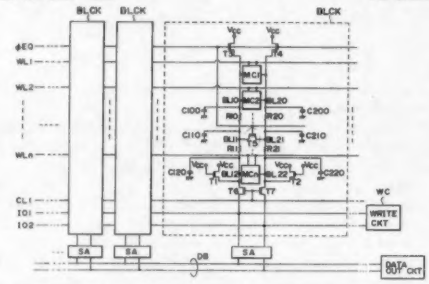
first signal line equalizing means provided corresponding respectively to said plurality of signal line pairs, each receiving said first equalize signal, for equalizing the potentials on said third and fourth signal lines when the first equalize signal is at said sixth level and stopping equalization when the first equalize signal is at said fifth level; and

second signal line equalizing means connected to said first and second signal lines for receiving said second equalize signal for equalizing the potentials on said first and second signal lines when the second equalize signal is at said seventh level and stopping equalization when the second equalize signal is at said eighth level.

5,487,044
SEMICONDUCTOR MEMORY DEVICE HAVING BIT LINE EQUALIZING MEANS

Takayuki Kawaguchi, Yokohama; Shigeto Mizukami, Kawasaki; Yasumitsu Nozawa, and Kouji Nakao, both of Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 34,417, Mar. 19, 1993, abandoned.
This application Jan. 17, 1995, Ser. No. 372,906
Claims priority, application Japan, Mar. 19, 1992, 4-063637
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—203 38 Claims



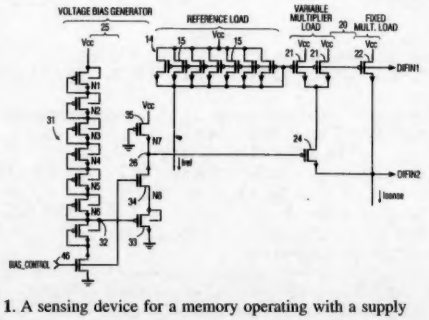
29. A semiconductor memory device, comprising:

a plurality of memory cells arranged in a column direction for outputting complementary data of each of the memory cells via a pair of bit lines, wherein bit line equalizing means for equalizing the pair of bit lines, prior to a data read operation, is connected between the pair of bit lines at approximately a middle position of the plurality of the memory cells arranged in the column direction and equalizes the pair of bit lines at memory cells located on each. Side of the middle position.

5,487,045
SENSE AMPLIFIER HAVING VARIABLE SENSING LOAD FOR NON-VOLATILE MEMORY

Thomas J. Trodden, Albuquerque, N.M., assignor to Philips Electroics North America Corporation, New York, N.Y.

Filed Sep. 16, 1994, Ser. No. 308,047
Int. Cl.[6] G11C 29/00
U.S. Cl. 365—205 11 Claims



1. A sensing device for a memory operating with a supply

voltage and comprising a plurality of memory cells each of whose ON and OFF states represents stored memory information and a reference cell which is maintained continuously in one of the ON and OFF states, said sensing circuit comprising:

(a) a reference circuit connected to the reference cell and representing a reference load capable of carrying a first reference load current,

(b) a sensing circuit connected to at least one of the memory cells and representing a sensing load for the memory cell, said sensing load being capable of carrying a second sensing load current, the ratio of said first reference load current to said second sensing load current being non-zero,

(c) means responsive to a value of the supply voltage for changing the ratio of said first reference load current to said second sensing load current.

5,487,046

MAGNETO-OPTICAL RECORDING MEDIUM HAVING TWO MAGNETIC LAYERS WITH THE SAME CURIE TEMPERATURE

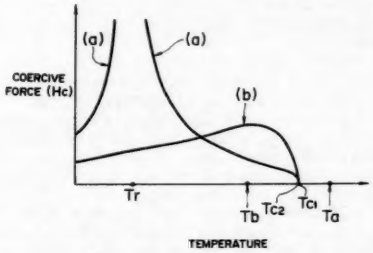
Atsuyuki Watada, Kawasaki; Toshiaki Tokita, Zama, and Motoharu Tanaka, Mishima, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 890,631, May 28, 1992, Pat. No. 5,369,629. This application Jul. 28, 1994, Ser. No. 282,212

Claims priority, application Japan, May 31, 1991, 3-155434

Int. Cl.[6] G11B *13/04*

U.S. Cl. 369—13 **1 Claim**



1. A magneto-optical recording medium comprising

a substrate and at least two magnetic recording layers overlaid thereon, including a first magnetic recording layer and a second magnetic recording layer in view of the incident direction of a laser beam to be applied thereto for recording information and/or reproducing recorded information, each of said first and second magnetic recording layers comprising as the main component an amorphous alloy of a rare earth metal and an iron-family transition metal, and constituting a perpendicular magnetic layer, the Curie temperatures of said first magnetic recording layer and said second magnetic recording layer being substantially the same, said first magnetic recording layer being bonded to said second magnetic recording layer through exchange force, the compensation point of said first magnetic recording layer being near room temperature, the magnetic moment of said rare earth metal of said alloy in said second magnetic recording layer exceeding the magnetic moment of said iron-family transition metal of said alloy in said second magnetic recording layer, and the compensation point of said second magnetic recording layer being not present in the range between room temperature and the Curie temperature of said second magnetic recording layer.

5,487,047

MAGNETOOPTICAL RECORDING APPARATUS FOR RECORDING INFORMATION IN A LEAD-IN REGION OF A RECORDING MEDIUM

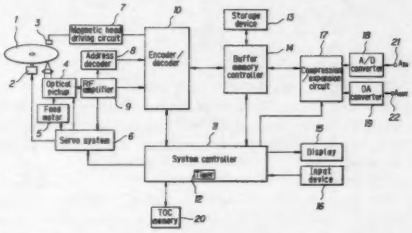
Nobuyuki Oka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 20, 1993, Ser. No. 50,536

Claims priority, application Japan, Apr. 24, 1992, 4-131884

Int. Cl.[6] G11B *17/22;7/00*

U.S. Cl. 369—32 **4 Claims**



1. A magnetooptical recording apparatus for recording data in a recording region of a magnetooptical recording medium and information representing contents of the recorded data in a lead-in region of the magnetooptical recording medium, said recording apparatus comprising:

a recording head for recording the data on the magnetooptical recording medium;

signal processing means for processing data supplied thereto and supplying the processed data to the recording head;

a timer for measuring a recording time in which the recording head records the data on the magnetooptical recording medium;

control means for controlling the recording head, wherein the control means interrupts a recording operation of the recording head for recording the data on the magnetooptical recording medium when the recording time measured by the timer coincides with a predetermined value, moves the recording head to the lead-in region of the magnetooptical recording medium, and causes the recording head to record information representing the contents of the data in the lead-in region of the magnetooptical recording medium;

first memory means for temporarily storing the data provided by the signal processing means, wherein the first memory means is controlled by the control means so that the data is read therefrom at a transmission rate higher than a transmission rate at which the data provided by the signal processing means is written therein; and

second memory means for storing the information representing the contents of the data recorded in the recording region of the magnetooptical recording medium.

5,487,048

MULTIPLEXING SENSE AMPLIFIER

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Mar. 31, 1993, Ser. No. 41,321

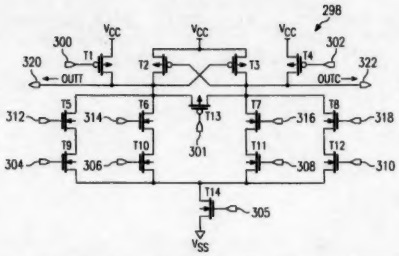
Int. Cl.[6] G11C *7/06*

U.S. Cl. 365—207 **13 Claims**

1. A memory system comprising:

a memory array having at least first and second pairs of data lines corresponding to columns in the memory array; and

a multiplexing sense amplifier including a selection stage having input lines connected to the first and second pairs of data lines, the selection stage also having a true output line and a complement output line, wherein output signals generated in the output lines are controlled by a first and second set of transistors, wherein each transistor in the first set has a gate connected to one of the input lines and each transistor in the second set is connected in series with one of the transistors in

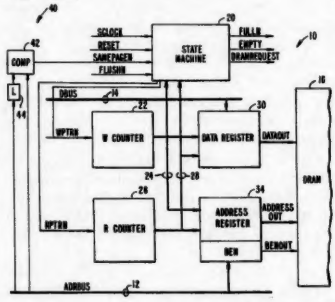


the first set and may be selectively turned on and turned off, wherein one of the two pairs of data lines may be selected by turning transistors on and off in the second set, wherein said multiplexing sense amplifier includes a common current source provided by a control transistor having a first source/drain connected to a power supply voltage and a second source/drain connected to the first and second sets of transistors by a common node, wherein the multiplexing sense amplifier may be enabled and disabled by turning the control transistor on and off, and wherein the selection stage further includes a p-channel cross-coupled amplifier.

5,487,049
PAGE-IN, BURST-OUT FIFO

Chia-Lun Hang, San Jose, Calif., assignor to Samsung Semiconductor, Inc., San Jose, Calif.

Filed Nov. 23, 1994, Ser. No. 344,758
Int. Cl.[6] G11C *7/00;8/00*
U.S. Cl. 365—221 **3 Claims**



1. A FIFO system for interfacing a system bus, including an address bus and a data bus, to a DRAM, with the DRAM operating in a normal access mode and a page mode, with data transferred at a higher page mode rate in the page mode, and with each storage location in the DRAM specified by a row address and a column address, said system comprising:

a data register having an input coupled to said data bus and an output coupled to a data input of the DRAM;

an address register, having an input coupled to said address bus and an output coupled to an address input of the DRAM;

a write control unit, coupled to said data and address registers, for writing page data having a first row address into said data register and writing column addresses of said page data into said address register; and

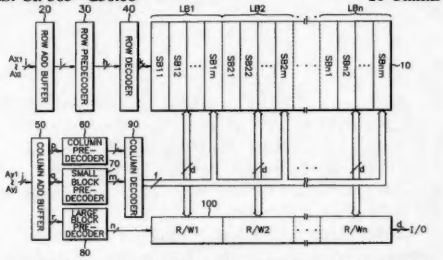
a read control unit, coupled to said data and address registers, for initiating a read operation to provide said page data to the data input of said DRAM and said column addresses to the address input of said DRAM at the page mode rate when the number of page data stored in said data register exceeds a predetermined number; and

a page change detection unit, coupled to said address bus and said read control unit, for initiating a read operation when a second row address transmitted on said address bus is different from the first row address of the page data stored in said data register.

5,487,050
DECODING CIRCUIT AND METHOD FOR A SEMICONDUCTOR MEMORY DEVICE

Kyeong-Rae Kim, Suwon; Seung-Kweon Yang, Seoul; Hee-Choul Park, Suwon, and Du-Eung Kim, Yongin, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 18, 1994, Ser. No. 229,082
Claims priority, application Rep. of Korea, Apr. 16, 1993, 6413/1993
Int. Cl.[6] G11C *8/00*
U.S. Cl. 365—230.06 **10 Claims**



1. A decoding circuit for semiconductor memory device having a memory cell array including a plurality of large blocks, each large block comprising of m small blocks (wherein m=2,3, . . .) including a plurality of memory cells being arranged in a matrix form, said circuit comprising:

a column decoder for selecting said small blocks and a bit line therein;

a small block predecoder for receiving a small block selection address to select said small blocks and for outputting said small block selection address to said column decoder;

a column predecoder for outputting a column selection address signal to said column decoder to select a predetermined column in said small blocks;

a reading/writing circuit for selecting said large blocks and for designating a data input/output path; and

a large block predecoder for receiving a large block selection signal and, after decoding said large block selection signal, for outputting the decoded signal to only said reading/writing circuit.

5,487,051
IMAGE PROCESSOR MEMORY FOR EXPEDITING MEMORY OPERATIONS

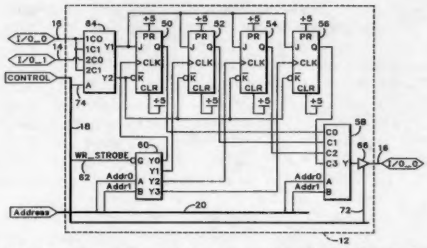
John R. Providenza, Beaverton, and Lee Boekelheide, Tigard, both of Oreg., assignors to Network Computing Devices, Inc., Mountain View, Calif.

Division of Ser. No. 77,705, Jun. 14, 1993, Pat. No. 5,345,555, Continuation of Ser. No. 617,359, Nov. 23, 1990. This application Mar. 18, 1994, Ser. No. 210,355
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—233 **13 Claims**

1. An electronic data storage system for effecting a selected algebraic operation between previously stored data and source data, and for storing the result in place of the previously stored data, wherein the result is predictable independently of accessing the value of the previously stored data, said system comprising:

a memory cell array for storing binary data, a memory cell thereof including memory cell modification means for performing logic operations within a said cell,

data storage selection means for accessing a cell in said array,



data input means for receiving source data adapted for algebraic combination with the previously stored data in said cell, and

control input means responsive to the selected algebraic operation for controlling said memory cell modification means to perform a said logic operation in the accessed memory cell to selectively change the previously stored value in said memory cell in accordance with the data input and the algebraic operation.

5,487,052

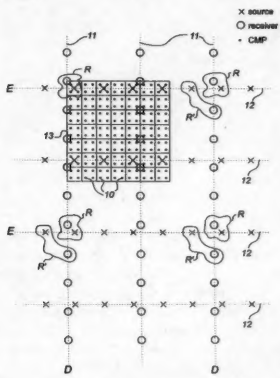
THREE DIMENSIONAL SEISMIC DATA ACQUISTION USING A REPEATING OFFSET ARRANGEMENT OF SOURCE AND RECEIVER LINES

Andreas Cordsen, Calgary, Canada, assignor to Geophysical Exploration & Development Corporation, Calgary, Canada

Continuation-in-part of Ser. No. 134,173, Oct. 8, 1993, Pat. No. 5,402,391. This application Aug. 18, 1994, Ser. No. 292,403

Int. Cl.[6] G01V *1/20*

U.S. Cl. 367—56 **4 Claims**



1. An improved method of three-dimensional seismic acquisition with respect to sub-surface acoustic impedance boundaries in the earth, comprising:

(a) providing a plurality of equally spaced seismic energy sources in a linear array to form a source line;

(b) providing a plurality of equally spaced seismic energy receivers in a linear array to form a receiver line;

(c) repeating steps (a) and (b) to form a patch having the source lines substantially equally spaced and parallel and the receiver lines also substantially equally spaced and parallel with the source lines intersecting the receiver lines in a rectangular grid pattern, said pattern having a ratio of the spacing between receiver lines and the spacing between sources which yields a remainder greater than zero and a ratio of the spacing between source lines and the spacing between receivers which also yields a remainder greater than zero, said source line, receiver line, receiver and source spacings being selected so that the sources and receivers are relatively offset and so that the relative offset between a source and a receiver is only substantially repeated at every second to tenth intersection of the source and receiver lines; and

(d) initiating seismic disturbances from the sources and reflecting seismic energy from sub-surface acoustic impedance boundaries and receiving said seismic reflections at the receivers.

5,487,053

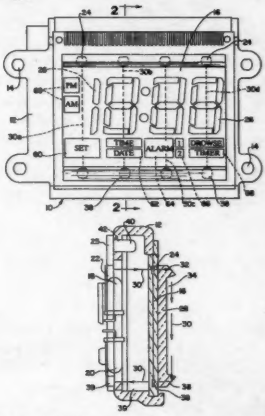
DIGITAL CLOCK

John L. Beiswenger, Strasburg, Pa., and Robert I. Schwimmer, Glendoe, Ill., assignors to Technomarket, L.P., Chicago, Ill.

Division of Ser. No. 98,464, Jul. 28, 1993, Pat. No. 5,381,388. This application Jul. 25, 1994, Ser. No. 179,524

Int. Cl.[6] G04C *17/00;19/00;* **G09G** *5/00*

U.S. Cl. 368—69 **20 Claims**



1. A digital clock which comprises an electronic timekeeping circuit, an electronic digital display connected to said timekeeping circuit to display time as controlled by said circuit, and an electronic control to cause changing of individual numerals displayed by said display in a plurality of locations by manually pointing at said individual numerals, said electronic control comprising a transparent touch-sensitive detector positioned in front of said digital display to permit the electronic control to determine touch location.

5,487,054

METHOD AND APPARATUS FOR SETTING A CLOCK IN A COMPUTER SYSTEM

Stephen P. Capps, San Carlos, and Martin R. Gannholm, Belmont, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

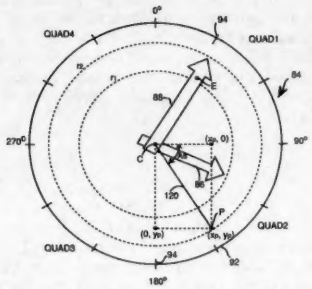
Filed Jan. 5, 1993, Ser. No. 1,111

Int. Cl.[6] G04B *18/00*

U.S. Cl. 368—185 **7 Claims**

1. A method for setting a clock in a computer system comprising:

displaying an analog clock face on a screen of a computer system the clock face having an origin at a center location thereof, wherein said analog clock face displays an hour hand extending radially outwardly from said origin, said hour hand corresponding to a current hour parameter of a real-time clock, and further displays a minute hand extending radially outwardly from said origin, said minute hand corresponding to the current minute parameter of said real-time clock, said hour hand and said minute hand being different in length;



making a stroke on said screen using a pointer means by contacting the pointer means with at least a portion of said clock face;

determining whether the distance from the clock origin to a selected point in said stroke is closer to the length of said hour hand or length of said minute hand; and

moving one of said hour hand and said minute hand to indicate a new hand position indicative of a new clock time, wherein the determination of which hand is to be moved is based at least in part upon whether the distance to the selected point of said stroke is closer to the length of the hour hand or the length of the minute hand; and

resetting said real-time clock to correspond to said new clock time.

5,487,055

INFORMATION RECORDER WITH TRACKING AND SEEKING OPERATIONS USING LOW FREQUENCY TRACKING AND LENS POSITION SIGNALS

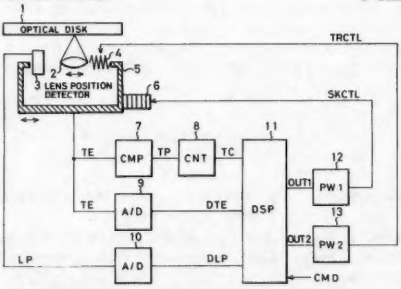
Haruyuki Suzuki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 14, 1994, Ser. No. 196,298

Claims priority, application Japan, Feb. 19, 1993, 5-030675

Int. Cl.[6] G11B *7/085*

U.S. Cl. 369—44.28 **5 Claims**



1. An information recorder comprising:

light spot displacing means for displacing a light spot irradiated onto a rotating disk-shaped recording medium in a direction crossing a track on the recording medium;

tracking error detecting means for detecting a deviation in relative position between the light spot and a track to be followed up and outputting a tracking error signal;

speed detecting means for detecting a track crossing speed of the light spot;

target speed generating means for generating a target speed of the light spot;

phase compensating means for receiving the tracking error signal from the tracking error detecting means and advancing a phase of the tracking error signal;

extracting means for receiving the tracking error signal from the tracking error detecting means and extracting a low frequency region component of the tracking error signal;

subtracting means for obtaining a difference in speed between the track crossing speed and the target speed;

first adding means for adding the low frequency region component extracted by the extracting means to the phase advanced component obtained by the phase compensating means;

second adding means for adding the low frequency region component extracted by the extracting means to the difference in speed obtained by the subtracting means; and

driving means for operating the light spot displacing means so as to make the light spot follow up an arbitrary track on the recording medium in accordance with an output of the first adding means in a track following mode and to make the light spot cross the track in accordance with an output of the second adding means in a seek mode.

5,487,056

OPTICAL RECORDING MEDIUM AND RECORDING AND/OR REPRODUCING APPARATUS USING SUCH OPTICAL RECORDING MEDIUM

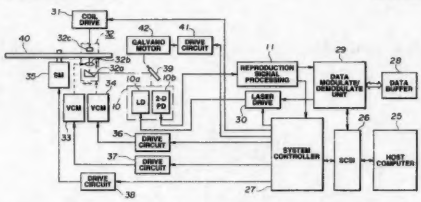
Shigeaki Wachi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 189,543, Jan. 26, 1994. This application Apr. 4, 1995, Ser. No. 416,141

Claims priority, application Japan, Jan. 29, 1993, 5-034461; Jun. 30, 1993, 5-186699

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—44.34 **2 Claims**



1. A recording/reproducing apparatus for carrying out recording or reproduction by using an optical recording medium on which a data recording area, where pairs of guide grooves are formed on both sides of tracks for recording a data signal, and a predetermined area, where no guide groove is formed and grooves are formed at the track center positions, are caused to have the same length and are arranged one after another in a track direction, with one end side of the groove in the predetermined area overlapping with the data recording area, and wherein an area including no groove is formed at the boundary between the other end side of the groove in the predetermined area and a next data recording area,

the apparatus comprising;

bisected photo detecting means for detecting a return light of a laser beam irradiated onto the optical recording medium;

difference signal output means for taking a difference between output signals from the bisected photo detecting means to generate a tracking error signal;

inverting means for inverting the polarity of the tracking error signal from the difference output means; and

signal switching means for carrying out switching between the tracking error signal from the difference signal output means and the inverted tracking error signal from the inverting means at each boundary between the data recording area and the predetermined area;

determining means for determining the boundary between the data recording area and the predetermined area by detecting a start position and an end position of the predetermined area in an area where one end side of the groove of the predetermined area overlaps with the data recording area and an area where no groove is formed on the other end side of the groove to switch between the tracking error signal and the inverted

tracking signal in accordance with the detected start position and the detected end position.

5,487,057

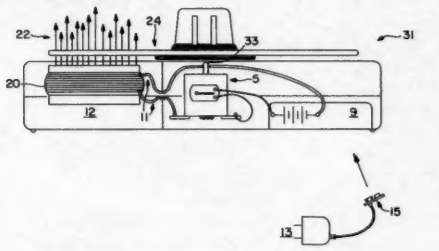
APPARATUS AND METHOD FOR REDUCING ELECTRONIC RELAXATION NOISE PRESENT INFORMATION RECORDING MEDIUM

John C. Bedini, Coeur d'Alene, Id., assignor to Bedini Electronics, Inc., Coeur d'Alene, Id.

Continuation-in-part of Ser. No. 15,897, Feb. 10, 1993, abandoned, and a continuation of Ser. No. 897,892, Jun. 12, 1992, abandoned, which is a continuation of Ser. No. 521,690, May 8, 1990, abandoned. This application Jun. 22, 1994, Ser. No. 264,074

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—107 **19 Claims**



14. A method for reducing relaxation noise in an information recording medium comprising rotating said information recording medium through a non-visible modulated electromagnetic field.

5,487,058

OPTICAL PICK-UP SYSTEM WITH IMPROVED LIGHT-CONVERGENCE CONSTRUCTION

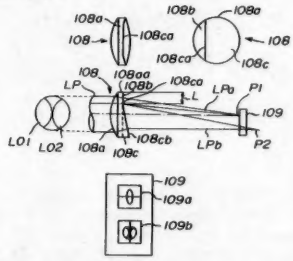
Junichi Kitabayashi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 2, 1994, Ser. No. 191,321

Claims priority, application Japan, Feb. 9, 1993, 5-021177; May 6, 1993, 5-127783; May 20, 1993, 5-139839

Int. Cl.[6] G11B *7/135*

U.S. Cl. 369—112 **24 Claims**



1. An optical pick-up system comprising:

a light source for emitting light;

an objective lens for causing light emitted from said light source to converge onto an optical recording medium;

a beam splitter for separating light, reflected from said optical recording medium, from the bundle of rays emitted from said light source;

a detective lens for causing said light, reflected from said optical recording medium and then separated by means of said beam splitter, to converge; and

a detective photosensitive element disposed at a position at which the light converged by means of said detective lens approximately converges;

and wherein:

said detective lens has first and second surfaces, said second surface of said detective lens being behind said first surface;

said first surface faces said beam splitter and is formed to be convex so as to cause the bundle of rays to converge; and

said second surface comprises two component surfaces which are combined with one another so that the line of intersection, formed where said two component surfaces meet, does not intersect the axis associated with the convexity of said first surface.

5,487,059

HEAT SHUT OFF CONDITION DETERMINATION METHOD AND APPARATUS FOR OPTICAL RECORDING, AND OPTICAL RECORDING METHOD AND APPARATUS

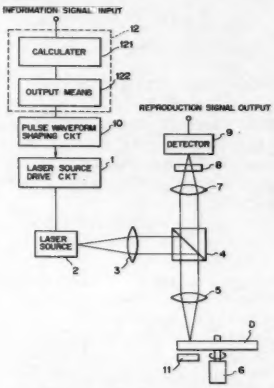
Jun Saito, Tokyo, and Shinichi Kurita, Yokohama, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Oct. 19, 1993, Ser. No. 137,967

Claims priority, application Japan, Jan. 20, 1992, 4-281723

Int. Cl.[6] G11B *11/12;13/04*

U.S. Cl. 369—116 **12 Claims**



4. An optical recording apparatus comprising:

a laser source for emitting a laser beam;

radiation means for radiating the laser beam onto an optical recording medium;

moving means for changing a radiation position of the laser beam on said medium;

modulation means operative in a recording mode for raising an intensity of the laser beam to be radiated onto said medium from an intensity P_{pre} for maintaining a pre-heat state, in which the temperature of the medium surface becomes a predetermined temperature Θ_{pre}, to an intensity P_{W1} higher than P_{pre} so as to form a mark, reducing the intensity to an intensity P_{LB} lower than P_{pre} after the intensity P_{W1} is maintained for a time T_{W1}, and raising the intensity to P_{pre} after an elapse of a time T_{off} preparatory to forming a next mark; and

condition determination means for determining the respective values as a combination for satisfying the following formula:

$$T_{off} = \tau \times \ln [\{(P_{W1} - P_{LB}) - (P_{W1} - P_{pre}) \times \exp(-T_{W1}/\tau)\} \div (P_{pre} - P_{LB})]$$

where τ is a thermal time constant of said optical recording medium.

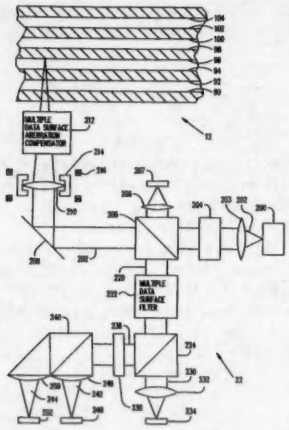
5,487,060
MULTIPLE DATA SURFACE DATA STORAGE SYSTEM AND METHOD

Hal J. Rosen, Los Gatos; Kurt A. Rubin, Santa Clara, and Timothy C. Strand, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 710,227, Jun. 4, 1991, abandoned. This application Dec. 6, 1993, Ser. No. 168,116

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—118 **16 Claims**



4. An optical data storage system comprising:

a laser;

an optical medium having a plurality of data surfaces separated by light transmissive elements;

an optical transmission device, including an adjustable focus device, for focusing a light beam from the laser to one of the data surfaces of the medium;

a control device connected to the focus device for controlling the focus device to focus the light beam to one of the data surfaces; and

an optical reception device for receiving the light beam after it is reflected from the optical medium and providing a data signal responsive thereto, the optical reception device having a collimation device for collimating the light beam reflected from the data surface to which the light beam was focussed, and passing as noncollimated light the light that was reflected from the other data surfaces, and a filter for passing said collimated reflected light and rejecting said noncollimated light, wherein the filter comprises a focus lens for focusing said collimated light to a focal spot, a first light blocking member located in a plane of said focal spot and having an aperture at said focal spot, a second light blocking member located between the focus lens and the first blocking member, the second blocking member having an annular shaped aperture for allowing light to pass, and a collimating lens for collimating the light passing through said aperture of the first blocking member.

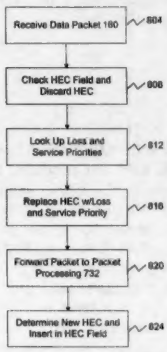
5,487,061
SYSTEM AND METHOD FOR PROVIDING MULTIPLE LOSS AND SERVICE PRIORITIES

Thomas A. Bray, Sarasota, Fla., assignor to Loral Fairchild Corporation, Syosset, N.Y.

Filed Jun. 27, 1994, Ser. No. 265,969

Int. Cl.[6] H04J *3/14*

U.S. Cl. 370—13 **21 Claims**



21. A system for implementing service class features in a packet switch, comprising:

(a) means for determining service class parameters based on information contained in a header of a received packet; and

(b) means for inserting said service class parameters in a temporarily unused error code field in said header of said received packet header before said received packet is sent through a switch fabric.

5,487,062
LOOPED BUS SYSTEM FOR CONNECTING PLURAL NODES OR PLURAL CIRCUIT CARDS

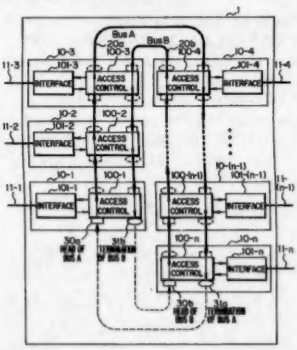
Junichirou Yanagi, Kodaira; Akihiko Takase, Tokyo, and Setsuo Takahashi, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1994, Ser. No. 230,152

Claims priority, application Japan, Apr. 19, 1993, 5-091065

Int. Cl.[6] H04L *12/437*

U.S. Cl. 370—16.1 **8 Claims**



1. A looped bus system comprising a plurality of node means; and first and second buses connecting the plurality of node means in a loop and having opposite directions of signal transmission, wherein each of the node means includes a head of bus function and a termination of bus function for each of the first and second buses such that said system is operable under normal and failure conditions in such a manner that:

the head of bus function for the first bus and the termination of bus function for the second bus are activated in one of the node means;

the termination of bus function for the first bus and the head of bus function for the second bus are activated in another one of the node means, and

the head of bus function and the termination of bus function are inactive in the other node means.

5,487,063

POINT-TO-MULTIPOINT CONNECTION SYSTEM

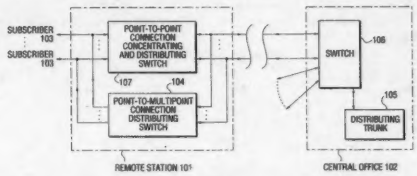
Satoshi Kakuma; Shiro Uriu; Shuji Yoshimura; Yasuhiro Aso, and Masami Murayama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 848,933, Mar. 10, 1992, abandoned. This application Feb. 14, 1994, Ser. No. 194,805

Claims priority, application Japan, Mar. 19, 1991, 3-055018

Int. Cl.[6] H04L *12/18;12/56;* H04M *7/00*

U.S. Cl. 370—56 5 Claims



1. A point-to-multipoint connection system using a broadband ISDN switching system to be operated in an asynchronous transfer mode, said connection system having one or more configurations in which a plurality of remote stations for concentrating and distributing data from and to subscribers are accommodated from a central office, said connection system comprising:

point-to-point connection concentrating and distributing switch means, in each of said remote stations, for receiving ATM cells and for concentrating, switching and distributing to a subscriber accommodated in each remote station a first cell having an attribute of a point-to-point broadband asynchronous transfer mode connection among the received ATM cells and which is distributed from the central office, and

point-to-multipoint connection distributing switch means, provided in parallel with said point-to-point connection concentrating and distributing switch means in each of said remote stations, for receiving the ATM cells and for switching and distributing to one or more subscribers accommodated in each remote station a second cell which has an attribute of a point-to-multipoint connection among the received ATM cells and which is distributed from the central office.

5,487,064

NETWORK LAYER PACKET STRUCTURE

Claude Galand, Cagnes sur Mer, and Gerald Lebizay, Vence, both of, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1994, Ser. No. 251,073

Claims priority, application European Pat. Off., Jun. 3, 1993, 93480068

Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—60 4 Claims

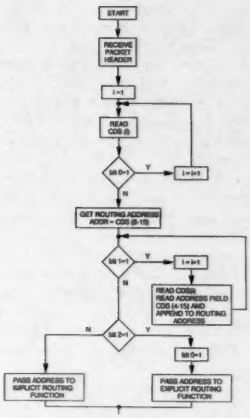
1. For use in a fast packet switching network used for transporting digital data packets, each packet having a header structure which includes a plurality of command and data segments, each with a disable indicator and one or more control bits, said network having a plurality of switching nodes interconnected by transmission links, a method of processing packets, said method being implemented at one or more of the switching nodes and including the steps of:

receiving packets from other switching nodes over the transmission links;

detecting the state of the disable indicator in each of the command and data segments in the header structure of each received packet;

passing over any command and data segment having a disable indicator having a predetermined first value; and

performing predetermined operations on the packet in accordance with the control bits found in the first command and data segment encountered having a disable indicator having a predetermined second value.



5,487,065

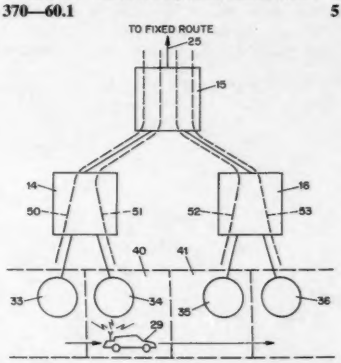
METHOD AND APPARATUS FOR SUPPORTING MOBILE COMMUNICATIONS IN ASYNCHRONOUS TRANSFER MODE BASED NETWORKS

Anthony S. Acampora, Freehold, N.J., and Mahmoud Naghshineh, Fishkill, N.Y., assignors to The Trustees of Columbia University in the City of New York, N.Y.

Continuation-in-part of Ser. No. 67,717, May 26, 1993. This application Mar. 4, 1994, Ser. No. 206,443

Int. Cl.[6] H04L *12/56;12/66;* H04B *7/26*

U.S. Cl. 370—60.1 5 Claims



1. A mobile-communications connection-and-routing method comprising the steps of:

detecting an attempted mobile communication in the vicinity of a first base station in a network comprising a plurality of switches, communication links and base stations, each base station corresponding to a geographical cell;

setting up a connection tree within the network, the connection tree comprising a plurality of communication routes, each route extending from a first switch within the network through at least one other switch and at least two communication links to a base station, each base station situated within a predetermined distance of the first base station, so that a route is defined from each of the base stations within the predetermined distance to the first switch;

setting up a fixed route within the network which extends from the first switch to a location within the network and outside of the connection tree;

providing the first switch with first routing information from the first switch to the connection tree and with second routing information from the first switch to the location within the network and outside of the connection tree;

admitting the communication to the connection tree; and

routing the communication through a first route between the first base station and the first switch, the first route being one of the plurality of communication routes within the connection tree, and between the first switch and the location outside of the connection tree through the fixed route, whereby the mobile user can communicate back and forth along a complete communication route with the location outside of the connection tree;

further comprising, at the first switch and upon a communication from the connection tree to the location within the network and outside of the connection tree, the steps of:

storing a virtual channel identifier,

identifying a current base station,

determining whether the identified current base station differs from a previously identified base station, and, in case of difference,

replacing the first routing information with new first routing information from the first switch to the connection tree.

5,487,066

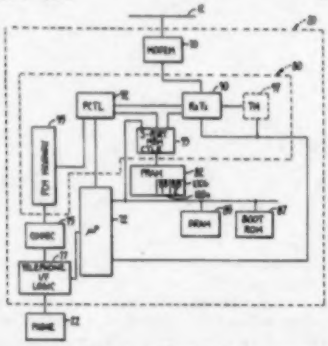
DISTRIBUTED INTELLIGENCE NETWORK USING TIME AND FREQUENCY MULTIPLEXING

Robert P. McNamara, San Jose; Alan Saldinger, Cupertino; Robert J. Cringle, Mountain View; Gigi C. Chu, Santa Clara; Shanubhog G. Sangameswara, Cupertino; Peterpaul Vita, Saratoga; Michael M. Ouye, Mountain View; David R. F. Stevens, Los Altos; Celeste Baranski, Palo Alto; Cai U. Monsson, Capitola; Timothy P. Murphy, Mountain View; Kevin T. Murphy, Los Altos; Gary M. Ellis, San Jose, and Ranjit Ghate, Oakland, all of Calif., assignors to First Pacific Networks, Inc., San Jose, Calif.

Continuation of Ser. No. 345,490, Apr. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 170,968, Mar. 21, 1988, abandoned. This application Jan. 21, 1994, Ser. No. 185,673

Int. Cl.[6] H04J *3/26;* **H04L** *12/26*

U.S. Cl. 370—85.2 **37 Claims**



1. A method for transmitting boot images to a number of nodes in a network, comprising:

the step, performed continuously, of generating a periodic timing mark to define a series of cycles wherein (i) at least one interval within each cycle is designated a signalling packet ("SP") interval, and (ii) a plurality of other intervals within each cycle are designated timeslots;

the step, performed by a network boot unit ("NBU"), of transmitting a boot control signalling packet ("BCSP") in a given SP interval, wherein the BCSP (i) contains boot control information signifying that a boot image is to be transmitted, (ii) specifies at least one timeslot in which the boot image is to be transmitted in later cycles, and (iii) contains image descriptor information identifying the boot image; and

the steps, performed by the NBU, of transmitting boot packets, each containing a portion of the identified boot image, within the specified timeslot or timeslots for each of a number of cycles subsequent to the frame in which the BCSP was transmitted.

5,487,067

AUDIO DATA COMMUNICATIONS

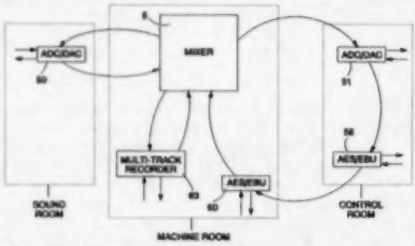
Takashi Matsushige, Stanton Harcourt, England, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 1, 1994, Ser. No. 189,783

Claims priority, application United Kingdom, Apr. 1, 1993, 9306879

Int. Cl.[6] H04L *12/423*

U.S. Cl. 370—85.7 **26 Claims**



1. Data communications apparatus comprising:

a master device for processing digital audio data; and

a plurality of slave devices connected in a ring network with the master device, each slave device having a plurality of data channels associated therewith and being arranged to supply audio data from the ring network to the data channels associated with the slave device and/or to supply audio data to the ring network from the data channels associated with the slave device;

wherein the master and slave devices are arranged for serial communication via the ring network of frames of digital audio data, each frame comprising a plurality of data blocks which contain audio sample data corresponding to respective audio signals; and

wherein the master and slave devices are further arranged for communication via the ring network of set-up data comprising set-up commands transmitted by the master device to the slave devices and set-up responses transmitted by the slave devices to the master device, whereby the master device determines the arrangement of slave devices around the ring network and the number of data channels associated with each slave device, and, in dependence upon the arrangement and the number of data channels, allocates to a slave device, which is arranged to supply audio data from the network to the data channels associated with the slave device, a sequence of data blocks within each frame of the digital audio data format in which audio data will be transmitted to that slave device.

5,487,068

METHOD FOR PROVIDING ERROR CORRECTION USING SELECTIVE AUTOMATIC REPEAT REQUESTS IN A PACKET-SWITCHED COMMUNICATION SYSTEM

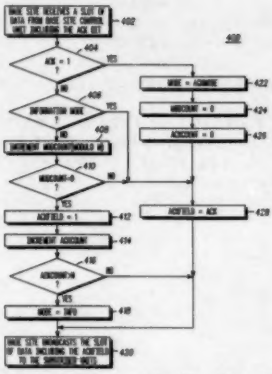
Jeffrey C. Smolinske, Hoffman Estates; Phieu M. Tran, Lincolnwood; Christopher L. Clanton, Chicago, and Robert C. Scheibel, Jr., Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 29, 1994, Ser. No. 283,085

Int. Cl.[6] H04L *1/16*

U.S. Cl. 370—94.1 **4 Claims**

1. A method for providing a contention-free access uplink channel for a subscriber unit for transmission of predetermined types of messages in a slotted communication system, comprising the steps of:



A) transmitting, by a base site, a plurality of downlink packets to a first subscriber unit, wherein a packet includes segments;

B) utilizing, by the base site, subscriber unit control information to reserve a next time slot for automatic repeat request information from the first subscriber unit;

C) transmitting, by the first subscriber unit, using the reserved time slot, information on the success/failure of received segments of a first packet of the plurality of packets;

D) temporarily interrupting, by the base site, a packet currently being transmitted to retransmit segments of the first packet that have an error/errors; and

E) recycling to step B until the entire first packet is successfully transmitted.

5,487,069

WIRELESS LAN

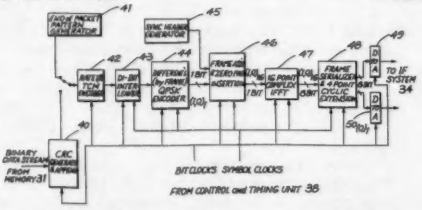
John D. O'Sullivan, Ermington; Graham R. Daniels, Willoughby; Terence M. P. Percival, Lane Cove; Diethelm I. Ostry, Petersham, and John F. Deane, Eastwood, all of, Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Australia

Division of Ser. No. 12,432, Feb. 20, 1993. This application Nov. 23, 1993, Ser. No. 157,375

Claims priority, application Australia, Nov. 27, 1992, PL6069

Int. Cl.[6] H04B *7/01*

U.S. Cl. 370—94.3 **72 Claims**



49. A transmitter for operation in a confined multipath transmission environment, said transmitter comprising antenna means coupled to transmission signal processing means in turn coupled to an input data channel, said transmitter being operable to transmit data at radio frequencies in excess of 10 GHz, and said transmission signal processing means comprising modulation means for modulating input data of said input data channel into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of the time delay of significant ones of non-direct transmission paths.

5,487,070

APPARATUS FOR REPRODUCING RECEIVED DATA

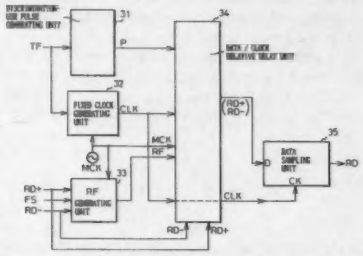
Yukio Furukawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 30, 1993, Ser. No. 84,021

Claims priority, application Japan, Jul. 2, 1992, 4-175464

Int. Cl.[6] H04J *3/06*

U.S. Cl. 370—108 **11 Claims**



1. An apparatus for reproducing received data which received transmitted signals from a plurality of slave stations at a master station connected to the plurality of slave stations by a bus mode and samples the received data signals by clock signals to obtain the reproduced received data, comprising:

a single fixed clock generating unit for generating the clock signals,

a data sampling unit which receives as input the above received data signals, and samples said data signals at intervals defined by said single fixed clock generating unit, and outputs the reproduced received data, and

a relative delay unit coupled to the data sampling unit and causing a relative delay between a phase of said received data signals and a phase of said clock signals.

5,487,071

RADIO LINK FAILURE

Ingrid V. Nordstrand, Sundbyberg, and Stig R. Bodin, Spånga, both of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

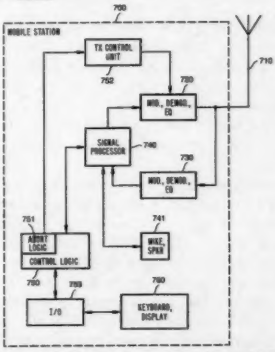
PCT No. PCT/SE93/00085, § 371 Date Oct. 5, 1993, § 102(e) Date Oct. 5, 1993, PCT Pub. No. WO93/16562, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 3, 1993, Ser. No. 129,095

Claims priority, application Sweden, Feb. 5, 1992, 9200336

Int. Cl.[6] H04J *3/14*

U.S. Cl. 370—110.1 **1 Claim**



1. A cellular mobile telephone system using TDMA-type signalling structured in layers described by an OSI model, comprising

a plurality of mobile radio units which are connected with

a communication network via radio channels, the communication network including radio base stations,

wherein signalling between the mobile radio units and the network is effected on a data link layer with at least one first signal flow responsible for maintaining a physical connection, and a second signal flow responsible tier transmitting data which is not concerned with maintaining said physical connection, and

wherein at least one of the mobile radio units and the communication network include means for aborting the physical connection, and means for monitoring correct transmission of the first and second signal flows,

wherein the aborting means are activated when the monitoring means indicate a broken connection based on the first signal flow and the aborting means are not activated when the monitoring means indicate a broken connection based on the second signal flow.

5,487,072

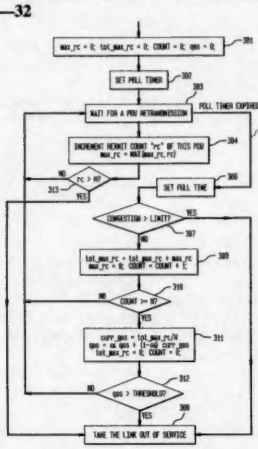
ERROR MONITORING ALGORITHM FOR BROADBAND SIGNALING

Krishna Kant, Township of Marlboro, Monmouth County, N.J., assignor to Bell Communications Research Inc., Morristown, N.J.

Filed Jun. 30, 1994, Ser. No. 269,267

Int. Cl.[6] G06F *11/00;* **G08C** *25/02;* **H04L** *1/18*

U.S. Cl. 371—32 **14 Claims**



1. A method of error monitoring a communications link on which messages are transmitted between a transmitter and a receiver, which transmitter retransmits only those messages either received in error or not received by the receiver, and which transmitter stores each message until it is correctly received by the receiver together with a retransmission count of the number of times each message is retransmitted, said method comprising the steps of:

1) in a fixed interval, determining the maximum retransmission count for each message stored in the transmitter;

2) for a block comprising a plurality (N) of successive fixed intervals, computing the average of the maximum retransmission counts for those messages stored in the transmitter during those successive fixed intervals to determine a quality of service factor, said quality of service factor being determined after every current fixed interval based on the average Of the maximum retransmission coupes of a block that ends with the current fixed interval;

3) comparing said quality of service factor with a predetermined threshold; and

4) removing the link from service if the quality of service factor of the block is greater than the predetermined threshold.

5,487,073

TEST SYSTEM FOR A VERY HIGH-SPEED RING NETWORK AND AN OPERATING PROCEDURE FOR THE SYSTEM

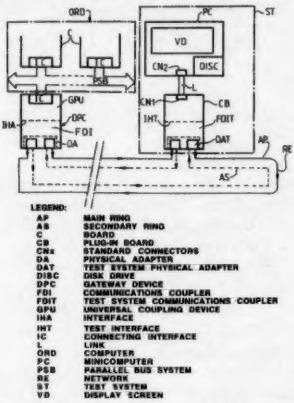
Pascal Urien, Villepreux, France, assignor to Bull S.A., Paris, France

Filed Oct. 5, 1992, Ser. No. 956,631

Claims priority, application France, Jan. 8, 1991, 91 12372

Int. Cl.[6] H04Q *3/00;* **H04J** *3/14*

U.S. Cl. 371—20.6 **5 Claims**



1. A test system (ST) for a high-speed ring network (RE), the test system comprising:

a data processing unit (PC) equipped with a data display device (VD) connected through a link (L) to a communications coupler (FDIT) connected to the network, transferring data frames thereon the communications coupler comprising:

a transfer management controller (CGT) including a microprocessor (MP) and a set of slave elements (SERV) with a set of function tests, the transfer management controller being associated with a control bus (BC) to which the microprocessor (MP), the set of slave elements (SERV), and an interface (IHAC) are connected;

a network access controller (CAR) in turn coupled both to a device (DA) for physical access to the network and to the control bus (BC);

a high-speed bus (BHD) coupled to the interface and to the network access controller (CAR); and

a storage memory (MST) coupled respectively to high-speed bus (BHD) and to the network access controller (CAR) through a command line (LC),

the control bus carrying control blocks including control characters that relate to the constitution of the frames, and information relating to the nature of the operations to be performed on each frame by the communications coupler,

the high-speed bus carrying the useful data from the frames corresponding to control blocks carried on the control bus, and

the management controller being for reading the control blocks and interpreting them to form the control characters that frame the useful data of the frames to be sent on the network, and for forming control blocks to be sent to the data processing unit, beginning with the control characters framing the useful data of a frame coming from network (RE);

a network test program (LOGT) running on the data processing unit; and

a set (ETF) of function tests implemented in communications coupler (FDIT) for stimulating the transfer of test frames on the network,

the test program (LOGT) both controlling the communications coupler by sending it commands that allow running the set of tests, and also the test program controlling the communica-

tions coupler by displaying data on the status of the network, such as data received by the coupler and sent by the coupler to the processing unit.

5,487,074

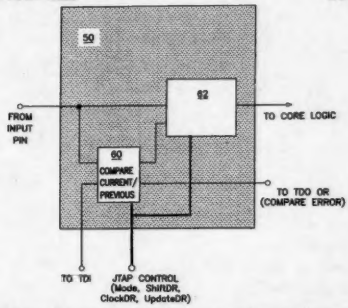
BOUNDARY SCAN TESTING USING CLOCKED SIGNAL

Patrick Sullivan, Chippewa Falls, Wis., assignor to Cray Research, Inc., Eagan, Minn.

Filed Mar. 20, 1995, Ser. No. 406,571

Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—22.3 **14 Claims**



1. Apparatus for testing electrical connections between a plurality of integrated circuits each integrated circuit comprising

an integrated circuit chip;

a plurality of electrical input and output connectors attached to the integrated circuit chip;

a boundary scan cell connected to each of the plurality of input and output connectors; and

boundary scan cell control logic located on the integrated circuit chip of each integrated circuit;

the boundary scan cells associated with the output connectors of the integrated circuit comprising a register having an output which toggles in response to a clock signal;

the boundary scan cells associated with the input connectors of the integrated circuit comprising a latch which latches a current state of the input connector, a register for storing a prior state of the input connector, and a comparator which compares the current and the prior states of the input connector and generates an error signal according to pre-determined criteria.

5,487,075

HIGH-SPEED STAGED DECODER/QUANTIZER

Guiseppe Caire, Turin, Italy; Javier Ventura Traveset, Leiden; Martin Hollreiser, Den Haag, both of, Netherlands, and Ezio Biglieri, Turin, Italy, assignors to Agence Spatiale Europeenne, Paris, France

Filed May 20, 1994, Ser. No. 246,516

Int. Cl.[6] G06F *11/10;* **H03M** *13/00*

U.S. Cl. 371—37.1 **9 Claims**

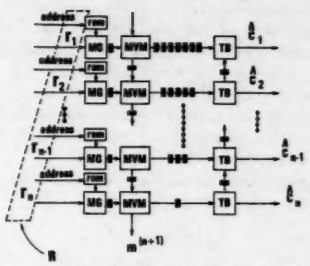
1. A decoder/quantizer comprising:

at least one stack of layered processor structure having n layers, each of the layers of the layered processor structure comprising a metric generator for receiving a component code to determine a matrix of metrics corresponding to branches of a trellis section;

a matrix-vector multiplier for receiving matrix data from the metric generator associated therewith and vector metrics for updating the matrix data;

a trace-back processing element for receiving updated matrix data from the matrix-vector multiplier associated therewith to produce a respective symbol of a selected codeword,

wherein each matrix-vector multiplier in the stack of layered processor structure updates the matrix data from the metric



generator associated therewith in a same layer in response to the updated matrix data from the matrix-vector multiplier in a next lower layer, and

wherein each trace-back processing element in the stack of layered processor structure updates the matrix data from the metric generator associated therewith in a same layer in response to the updated matrix data from the trace-back processing element in a next upper layer.

5,487,076

METHOD FOR SECURING DATA IN READ-WRITE MEMORIES IN MOBILE DATA STORAGE SYSTEMS

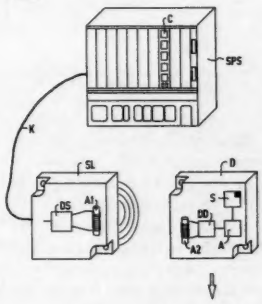
Heinrich Meyer, Nürnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 29, 1993, Ser. No. 85,265

Claims priority, application Germany, Jun. 30, 1992, 42 21 406.8

Int. Cl.[6] H03M *13/00*

U.S. Cl. 371—40.1 **2 Claims**



1. A method for securing data in a conventional write-read memory in a mobile data storage system comprising the steps of:

a) generating a specified number of error-correction data in a stationary coding device from a subset of useful data;

b) filing the total quantity of useful data block-by-block in the write-read memory each block being composed of useful data and the error-correction data (F) assigned to the useful data of that block, wherein the write-read memory has a standard word width and contains no separate redundancy-generating device, and wherein the width of a unit of error correction data is adapted to the standard word width;

c) when a memory query of one useful data unit is made, reading a block of data containing this data unit from the corresponding write-read memory using the stationary coding device, whereupon the useful data of the read block are checked at the coding device with the aid of the error-correction data of that block while correcting each incorrect useful data unit which is clearly recognized, using the stationary coding device; and

e) generating an error message as an output if it is not possible to correct at least one useful data unit.

5,487,077

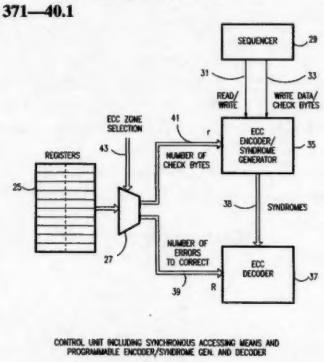
LOCATION DEPENDENT VARIABLE ERROR CORRECTION PROCESSING FOR MULTI-TRACK RECORDING MEDIA USING VARIABLE LENGTH CODING MEANS

Martin A. Hassner, Palo Alto; Luke C. K. Lang, Cupertino; Norman K. Ouchi, San Jose, all of Calif., and Uwe Schwiegelshohn, Dortmund Kirchhoerde, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1994, Ser. No. 247,446

Int. Cl.[6] G06F *11/10*

U.S. Cl. 371—40.1 **7 Claims**



CONTROL UNIT INCLUDING SYNCHRONOUS ACCESSING MEANS AND PROGRAMMABLE ENCODER/SYNDROME GEN. AND DECODER

1. A method for adjusting an error correction code capability according to a linear recording density of a zone of contiguous recording tracks on a storage surface or volume having at least two zones of different average linear recording density in a moving magnetic storage subsystem, comprising the steps of:

(a) associating with each zone a parameter pair (r,R), said pair defining the number r of error correction symbols (ECC) to be appended to data blocks to form a codeword written to tracks within the zone and the number R of correctable errors in the event of a non-zero remainder detected upon readback of a codeword from a track within the zone;

(b) writing a block of k data symbols to a track in a first one of the zones by adjusting a length of a shift register encoder by the r parameter, generating r ECC symbols by convolving the data block through said adjusted encoder and recorder a k+r symbol codeword in the track in said first zone; and

(c) at any time subsequent to step (b) reading back the codeword by adjusting the length of the shift register encoder operating as a syndrome generator by the parameter r associated with the first zone, and convolving it through the encoder to ascertain the presence of a non-zero remainder.

5,487,078

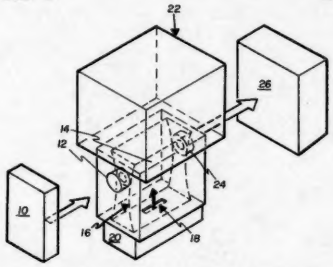
APPARATUS AND METHOD FOR GENERATING PROMPT X-RADIATION FROM GAS CLUSTERS

Charles K. Rhodes, Chicago, Ill., and Keith Boyer, Los Alamos, N.M., assignors to Board of Trustees of the University of Illinois, Urbana, Ill.

Filed Mar. 14, 1994, Ser. No. 213,601

Int. Cl.[6] H01S *3/30*

U.S. Cl. 372—5 **22 Claims**



1. A method for generating prompt X-radiation, said method comprising the steps of:

a. generating pulsed laser radiation having a chosen intensity and wavelength;

b. generating gaseous atomic clusters having a chosen density and size; and

c. directing the laser radiation into the gas clusters, whereby multiphoton coupling with the clusters occurs producing rapid atomic excitation, thereby removing selected inner-shell atomic electrons without removing all of the electrons in the next outermost shell.

5,487,079

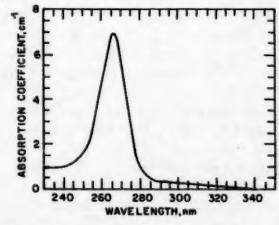
CONTINUOUSLY TUNABLE UV CE:LISAF SOLID STATE LASER

Leon Esterowitz, Springfield, Va., and Joseph F. Pinto, Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 5, 1995, Ser. No. 368,821

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—20 **21 Claims**



1. An ultraviolet solid state laser, comprising:

a laser cavity defined by a first mirror and an opposing second mirror;

a laser medium disposed in said laser cavity, consisting essentially of a LiSAF host material doped with an amount of cerium ions sufficient to produce a longitudinal mode laser emission when said laser medium is pumped by pumping means; and

means for pumping said laser medium.

5,487,080

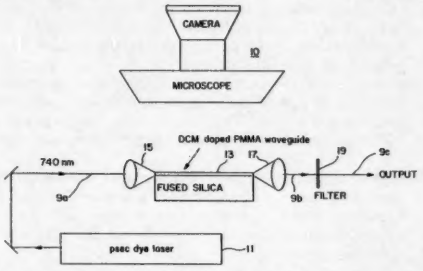
PRINCIPLE AND APPLICATIONS OF MULTIPHOTON PUMPED UPCONVERTED LASERS

Anadi Mukherjee, Albuquerque, N.M., assignor to University of New Mexico, Albuquerque, N.M.

Continuation-in-part of Ser. No. 787,309, Oct. 30, 1991, abandoned. This application Mar. 11, 1993, Ser. No. 29,838

Int. Cl.[6] H01S *3/09*

U.S. Cl. 372—69 **19 Claims**



15. Laser apparatus for producing desired coherent output radiation having substantial intensity levels thoughout at least the entire visible spectrum comprising:

a) a substrate;

b) an essentially planar body of material mounted on said substrate, said material being capable of simultaneous multiphoton absorption, and upconverted fluorescence, and

c) a source of pumping radiation providing a beam of radiation directed into said body, said pumping radiation comprising a pulse train of coherent, essentially infrared radiation having characteristics and an intensity level sufficient to produce two-photon pumped upconverted lasing in said body whereby the desired radiation is emitted therefrom.

5,487,081

PROCESS AND APPARATUS FOR THE TREATMENT OF THE WASTE GASES OF AN ARC FURNACE

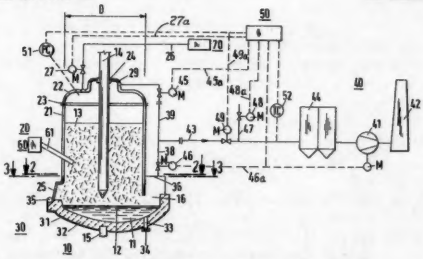
Heinrich Becker, Düsseldorf, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 22, 1993, Ser. No. 35,353

Claims priority, application Germany, Mar. 23, 1992, 42 09 765.7

Int. Cl.[6] F27D *17/00*

U.S. Cl. 373—9 **21 Claims**



7. An arc furnace for melting metal, comprising:

a furnace vessel for smelting a charge column, metal melt and slag, said furnace vessel having an upper portion and a lower portion, the charge column, the melt and the slag being disposed in the lower portion, at least one of gases, dust and vapors being generated in the furnace vessel by the smelting;

a cover operably connected to said upper portion for covering said furnace vessel; and

exhaust means in communication with said lower portion of said furnace vessel for guiding the at least one of gases, dust and vapors generated during smelting in said furnace vessel in a direction opposite to a naturally occurring flow direction through the charge column for bringing the at least one of the gases, dust and vapors into contact with the melt and the slag after leaving the charge column, and for removing the at least one of gases, dust and vapors from the arc furnace vessel in a region between said lower and upper portions of said furnace vessel.

5,487,082

ELECTRODE FOR ELECTROSLAG REMELTING AND PROCESS OF PRODUCING ALLOY USING THE SAME

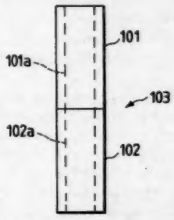
Tomoo Takenouchi; Yoshiaki Ichinomiya; Junji Ishizaka, all of Hokkaido; Junji Itagaki, Tokyo; Shuzo Ohhashi, Hokkaido; Tsukasa Azuma, Hokkaido, and Yasuhiko Tanaka, Hokkaido, all of, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Division of Ser. No. 73,465, Jun. 9, 1993. This application May 17, 1994, Ser. No. 243,736

Claims priority, application Japan, Jun. 11, 1992, 4-175976; Jul. 31, 1992, 4-223642; Aug. 14, 1992, 4-237607; Jan. 21, 1992, 4-305876; Jan. 22, 1992, 4-308054; Nov. 20, 1992, 4-333753; Jan. 21, 1993, 5-24974

Int. Cl.[6] H05B *3/60*

U.S. Cl. 373—42 **8 Claims**



5. A process of producing a high medium and low pressure turbine rotor having pressure portions made of an ingot, said ingot essentially consisting of a chemical composition which varies along with said pressure portions of the rotor from a high-medium pressure portion to a low pressure portion of the rotor, respectively, said process comprising the steps of providing an electrode having a hole which is formed along an axial direction in a core of said electrode, said electrode being made of a material corresponding to said chemical composition, melting said electrode to form said ingot, and forming said turbine rotor from the material.

5,487,083

HAND-OFF METHOD AND MOBILE STATION FOR SPREAD SPECTRUM MOBILE COMMUNICATION

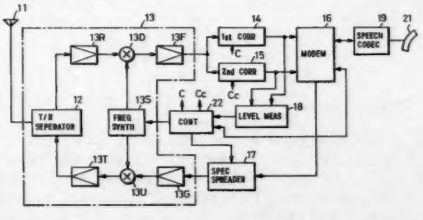
Nobuo Nakajima, and Kenji Imamura, both of Yokohama, Japan, assignors to NTT Mobile Communications Network Inc., Tokyo, Japan

Filed Apr. 29, 1994, Ser. No. 235,789

Claims priority, application Japan, May 12, 1993, 5-110544; May 12, 1993, 5-110545

Int. Cl.[6] H04K *1/10*

U.S. Cl. 375—200 **8 Claims**



1. A hand-off method for a spread spectrum cellular mobile communication system wherein a service area is split into a plurality of radio zones, a base station is provided in each radio zone, and a mobile station hands off a communication channel over which said mobile station is currently communicating from a base station to which said communication channel belongs to another base station in the same service area or a base station in another service area according to the movement of the mobile station and continues the communication;

said method comprising the steps of:

assigning a common radio channel to all radio zones in a service area, said common radio channel having a frequency common to all radio zones in the service area, each of the radio zones being assigned a number of radio channels corresponding to the traffic volume of said radio zone, said number of radio channels having different frequencies from one another;

assigning to said common radio channel, for each radio zone, spectrum spreading codes for control to define control channels and at least one spectrum spreading code communication to define a communication channel, said spectrum spreading codes being different from one another at least between adjoining radio zones;

providing a mobile station with at least two correlators;

and, when the mobile station hands off a radio channel over which the mobile station is currently communicating by using one of said at least two correlators, causing the mobile station to perform the following steps:

switching the currently communicating radio channel to a communication channel of the radio channel common to all radio zones;

scanning, while continuing the communication using said one correlator, the spectrum spreading codes for control in each radio zone and measuring received signal levels thereof using the other correlator, and determining the radio zone having the highest received signal level among the measured received signal levels to be a destination radio zone;

informing the base station through which the mobile station is currently communicating of the determined destination radio zone to request a channel switching; and

setting a communication channel specified by the base station through which the mobile station is currently communicating in response to the channel switching request and continuing the communication through a base station in the destination zone.

5,487,084

GENERATION OF A CLOCK FREQUENCY IN A SMART CARD INTERFACE

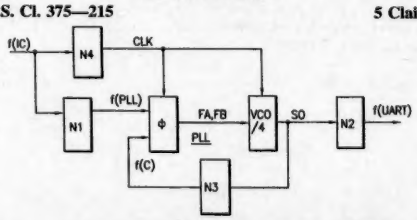
Rune Lindholm, Salo, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Continuation of Ser. No. 899,721, Jun. 17, 1992. This application Aug. 11, 1994, Ser. No. 288,976

Claims priority, application Finland, Jun. 26, 1991, 913108

Int. Cl.[6] H04L *7/00*

U.S. Cl. 375—215 **5 Claims**



1. A circuit arrangement for generating a clock signal of a predetermined frequency for a smart card interface which couples data from a smart card to a device, the data being transferred at a predetermined data rate, the arrangement comprising means for deriving the smart card interface clock signal from a smart card clock signal coupled to the arrangement, such that the frequency of the smart card interface clock signal and the data rate are of a predetermined ratio;

wherein said deriving means comprises gating means for outputting selective pulses of the smart card clock signal to serve as said smart card interface clock signal;

said deriving means of the arrangement comprises a phase locked loop and at least one counter coupled to an input thereof, said one counter dividing a frequency of said smart card clock signal to output an input signal to said phase locked loop, the phase locked loop including said gating means, said one counter having a predetermined coefficient to provide said predetermined ratio;

said phase locked loop is a digitally operated phase locked loop responsive to a drive clock signal, said arrangement further comprising a second counter for dividing the frequency of said smart card clock signal to output said drive clock signal; and

said phase locked loop has a locking range inversely proportional to a frequency division ratio of said second counter, the frequency division ratio of said one counter placing a frequency of said input signal to said phase locked loop within said locking range.

5,487,085

TRANSMISSION SYSTEM WITH IMPROVED EQUALIZER

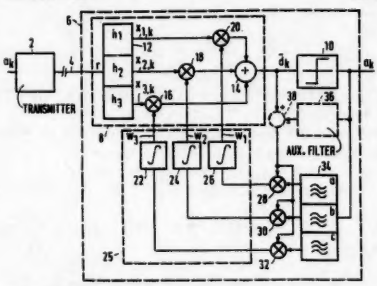
Ho W. Wong-Lam; Johannes W. Bergmans, both of Eindhoven, Netherlands, and Kevin D. Fisher, Palo Alto, Calif., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 20, 1994, Ser. No. 262,726

Claims priority, application Belgium, Jun. 23, 1993, 9300642

Int. Cl.[6] H03H *7/30*

U.S. Cl. 375—230 **11 Claims**



1. A digital transmission system comprising:

A. a transmitter generating a signal, a receiver, and a channel coupling the transmitter-generated signal to an input of the receiver;

B. said receiver comprising:

(a) an equalizer for receiving the signal from the receiver input and for deriving from the received signal a detection signal,

(b) a detector for receiving and for deriving from the detection signal detected symbols,

(c) said equalizer comprising: (i) an equalization filter comprising at least first and second branches for deriving at least first and second equalization signals, (ii) combining means for combining the first and second equalization signals weighted with respective first and second weight factors,

(d) adapting means for adapting the first and second weight factors in response to a correction signal associated with the respective first and second weight factors,

(e) first means for deriving a first auxiliary signal from the detection signal,

(f) second means for deriving a second auxiliary signal from the detected symbols,

(g) third means for combining the first and second auxiliary signals for deriving respective correction signals for the adapting means,

(h) said second means comprising symbol filters for respective first and second weight factors,

(i) said correction signals being dependent on at least two successively detected symbol values.

5,487,086

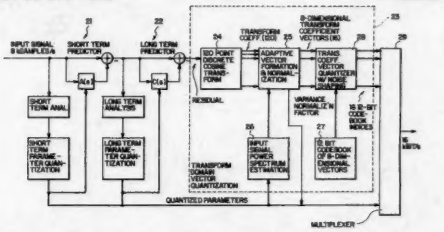
TRANSFORM VECTOR QUANTIZATION FOR ADAPTIVE PREDICTIVE CODING

B. R. Udaya Bhaskar, Gaithersburg, Md., assignor to Comsat Corporation, Bethesda, Md.

Filed Sep. 13, 1991, Ser. No. 759,361

Int. Cl.[6] H04B *14/04*

U.S. Cl. 375—243 **5 Claims**



1. An apparatus for processing digital information signals at a transmitter end of a communications system before said signals are transmitted to a receiver end, said apparatus comprising:

input means for receiving an input digital signal;

adaptive prediction means for performing adaptive prediction upon said input digital signal received by said input means; and

transform domain vector quantization means for transforming the output of said adaptive prediction means into frequency domain coefficients, grouping said coefficients into vectors and quantizing said vectors, wherein said transform domain vector quantization means further includes:

an input signal power spectrum estimation means for estimating the input signal power spectrum of said input digital signal; and

coefficient grouping means for grouping said coefficients into vectors in an adaptive manner based on results obtained from said input signal power spectrum estimation means.

5,487,087

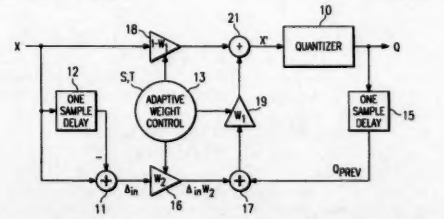
SIGNAL QUANTIZER WITH REDUCED OUTPUT FLUCTUATION

Alan V. McCree, Dallas, and Vishu R. Viswanathan, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 17, 1994, Ser. No. 245,090

Int. Cl.[6] H04B *14/06*

U.S. Cl. 375—245 **8 Claims**



1. A signal quantizer with reduced output fluctuation comprising:

a signal quantizer for providing a quantized output signal Q;

means responsive to an input signal X for multiplying said input signal by $1-w_1$ where w_1 is a first weight factor having a value between 0 and 1;

means responsive to said input signal X to be quantized for providing a difference signal Δ_{in} w_2 equal to the difference between said input signal X and a previous input signal X_{prev} multiplied by a second weight factor w_2 where w_2 has a value between 0 and 1;

means for adding to a previous quantizer output signal Q_{prev} said difference signal Δ_{in} w_2 and multiplying by said weight factor w_1 to yield w_1 $(Q_{prev}+w_2 \Delta_{in})$:

means for summing $(1-w_1)$ X and w_1 $(Q_{prev}+w_2\Delta_{in})$ to yield X';

means for applying X' to said quantizer.

5,487,088

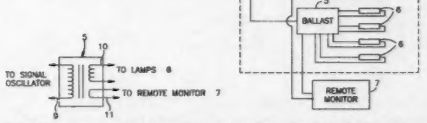
APPARATUS FOR MONITORING LAMP SYSTEM STATUS

Richard Weitz, Richmond, Va., and David J. Milius, El Paso, Tex., assignors to Infilco Degremont, Inc., Richmond, Va.

Filed Oct. 28, 1993, Ser. No. 144,637

Int. Cl.[6] H05B *41/16*

U.S. Cl. 315—276 **29 Claims**



1. Ballast monitoring apparatus for a lamp system having one or more lamps and one or more ballasts connected to said lamps comprising:

a sense winding contained on an output side of said ballasts for inducing a ballast status signal;

ballast monitoring means for receiving and processing said ballast status signal; and

means for displaying said processed ballast status signal.

5,487,089

NYQUIST FILTER FOR DIGITAL MODULATION

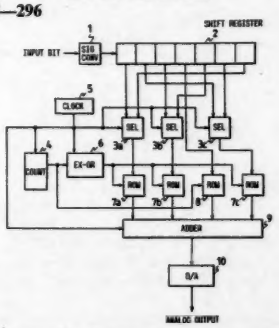
Kouei Misaizu, Kawasaki; Shoichiro Honda, Fukuoka, and Hiroshi Ohnishi, Tokyo, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 11, 1993, Ser. No. 16,222

Claims priority, application Japan, Feb. 17, 1992, 4-028765; Jan. 14, 1993, 5-004633

Int. Cl.[6] H04K *1/02*

U.S. Cl. 375—296 **5 Claims**



5. A Nyquist filter for digital modulation, comprising:

a first ROM for storing data representing first portions of predetermined impulse response waveforms which do not cause intersymbol interference, wherein the predetermined impulse response waveforms have second portions and central portions different from the first portions thereof, and the first portions and the second portions of the predetermined impulse response waveforms are symmetrical with respect to the central portions thereof;

a second ROM for storing data representing the central portions of the predetermined impulse response waveforms;

first means for accessing the first ROM and the second ROM to read out the data from the first ROM and the second ROM in response to an input signal, and for generating first data according to the data read out from the first ROM and the second ROM, the first data representing first and central portions of impulse response waveforms corresponding to the input signal;

second means for accessing the first ROM to read out the data from the first ROM in response to the input signal, for generating second data on the basis of the data read out from the first ROM, the second data representing second portions of impulse response waveforms corresponding to the input signal; and

means for combining the first data generated by the first means and the second data generated by the second means,

wherein each of said first portions of the predetermined impulse response waveforms corresponds to one symbol of the input signal, add each of said central portions of the predetermined impulse response waveforms corresponds to another symbol of the input signal.

5,487,090

SELECTIVELY CALLED RADIO RECEIVER IN WHICH BIT RATE DETECTION IS CONTROLLED WITH A PREDETERMINED RANGE

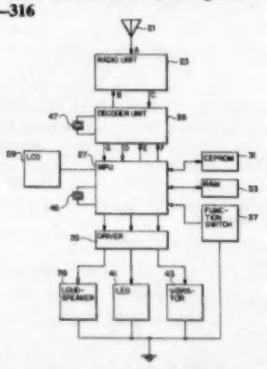
Motoki Ide, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 12, 1993, Ser. No. 134,683

Claims priority, application Japan, Jan. 12, 1992, 4-272165; Jan. 23, 1992, 4-285664

Int. Cl.[6] H04L *7/00;* **H04Q** *7/00*

U.S. Cl. 375—316 **8 Claims**



1. A selectively called radio receiver including a receiving unit operable with battery saving to produce a demodulated signal having a specific bit rate, said radio receiver comprising:

a synchronizing unit for establishing and keeping synchronism between said demodulated signal and operation of said receiving unit;

a bit rate detecting unit for detecting said bit rate with a controllable sensitivity to assist operation of said synchronizing unit when said synchronizing unit fails to keep said synchronism; and

bit rate detection control means connected to said synchronizing and said bit rate detectiong units for controlling said sensitivity within a predetermined sensitivity range while said synchronizing unit fails to keep said synchronism.

5,487,091

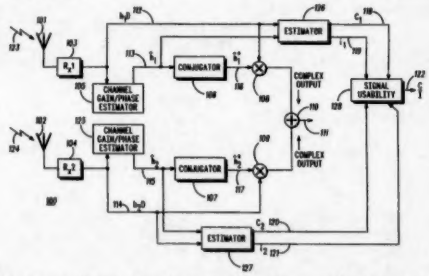
METHOD FOR DETERMINING SIGNAL USABILITY IN A DIVERSITY RECEIVER

Steven C. Jasper, Hoffman Estates, and Mark A. Birchler, Roselle, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 13, 1993, Ser. No. 106,170

Int. Cl.[6] H04B *7/10*

U.S. Cl. 375—347 **7 Claims**



1. In a diversity receiver that receives modulated signals, wherein the diversity receiver includes at least two receiver branches, wherein each of the at least two branches includes an antenna operably coupled to a receiver, the receiver operably coupled to a channel gain/phase estimator, the channel gain/phase estimator operably coupled to a complex conjugator, the complex conjugator operably coupled to a complex mixer to provide a complex output, and wherein the complex outputs of at least two receiver branches are combined to produce a diversity resultant, a method for determining signal usability of the diversity resultant, the method comprises the steps of:

a) receiving, by each of the at least two receiver branches, a modulated signal;

b) producing, by each of the at least two receiver branches, the complex output based on the modulated signal;

c) in each of the at least two receiver branches, estimating a desired component based on the modulated signal to produce estimated desired components;

d) in each of the at least two receiver branches, estimating an undesired component based on the modulated signal to produce estimated undesired components;

e) combining, independent of the undesired component on each of the at least two receiver branches, the complex output of each of the at least two receiver branches to produce the diversity resultant; and

f) estimating signal usability of the diversity resultant based on a functional mapping of the estimated desired components and the estimated undesired components into an estimated desired-to-undesired component power ratio.

5,487,092

SYSTEM FOR HIGH-SPEED SYNCHRONIZATION ACROSS CLOCK DOMAINS

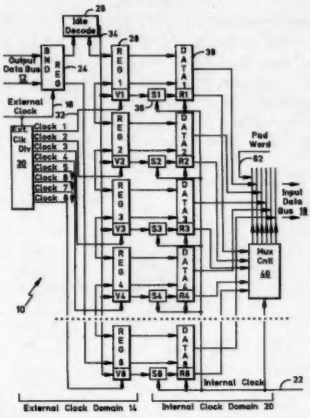
Damon W. Finney, San Jose, Calif., and Michael J. Rayfield, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1994, Ser. No. 363,121

Int. Cl.[6] H04L *7/00*

U.S. Cl. 375—354 **19 Claims**

1. A method for transferring digital signals representing a plurality of data words including pad words from an output bus in an external clock domain operating in synchrony with an external clock signal having a frequency and an interval across an asyn-



chronous boundary to an input bus in an internal clock domain operating in synchrony with an internal clock signal having a frequency and an interval, said method comprising the steps of:

(a) storing in a first register, in synchrony with said external clock signal, each in turn of a sequence of said data words from said output bus;

(b) producing, in synchrony with said external clock signal, a plurality of N of prolonged external clock signals each associated with one of a plurality N of second registers and each having an interval substantially equal to a plurality N of said external clock intervals;

(c) for each said prolonged external clock signal, transferring in synchrony with said each prolonged external clock signal said data word from said first register to said one second register associated with said each prolonged external clock signal and setting a valid flag in said one second register if said first register word is not an incoming pad word;

(d) transferring to a plurality N of third registers, each having a ready flag, said data word from each said second register associated with one of said third registers in which said ready flag is set;

(e) in synchrony with said internal clock signal, setting said ready flag in said third register associated with each said second register in which said valid flag has been set for more than one said internal clock signal interval; and

(f) connecting in sequence to said input bus, in synchrony with said internal clock signal, said data word from each said third register in which said ready flag is set and resetting said ready flag.

5,487,093

AUTORANGING DIGITAL ANALOG PHASE LOCKED LOOP

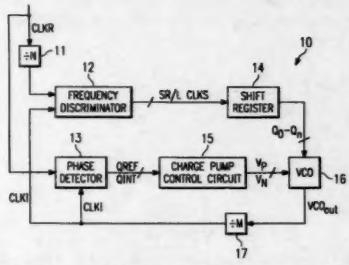
Bernhard H. Andresen, Dallas, and Roger A. Cline, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 26, 1994, Ser. No. 249,564
Int. Cl.[6] H03D *3/24*
U.S. Cl. 375—376 **8 Claims**

1. A phase locked loop circuit, comprising:

a frequency discriminator circuit for comparing the frequency of a first signal with the frequency of a second signal. and providing a first set of control signals in response to the comparison;

a shift register coupled to the frequency discriminator circuit, the shift register receiving the first set of control signals from the frequency discriminator circuit and shifting a binary value to the left or right in response to the first set of control signals, the shifting of the binary value to the left or right thereby creating a digital word;



an oscillator circuit coupled to the shift register, the oscillator circuit adjusting the frequency and phase of the second signal in a digital manner in response to the digital word from the shift register;

a phase detector for comparing the phase of the first signal with the phase of the second signal, and for providing a second set of control signals in response to the comparison; and

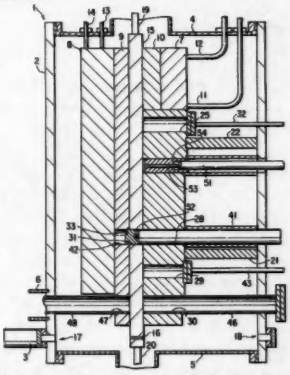
a control circuit coupled to the phase detector and the oscillator circuit, the control circuit converting the second set of control signals into analog control signals, the oscillation circuit being responsive to the analog control signals for adjusting the phase of the second signal in an analog manner.

5,487,094

DOUBLE-LAYER PELLET, METHOD OF MANUFACTURING THE SAME, AND APPARATUS FOR MANUFACTURING THE SAME

Shigeru Sudo, Nagoya, Japan, assignor to The Director-General of the National Institute for Fusion Science, Nagoya, Japan

Filed Sep. 1, 1994, Ser. No. 298,309
Claims priority, application Japan, Sep. 30, 1993, 5-244214
Int. Cl.[6] G21B *1/00*
U.S. Cl. 376—100 **6 Claims**



1. A method of manufacturing a double-layer pellet, comprising:

a first step of supplying a first material for forming an outer layer, into a space provided in a pellet carrier body;

a second step of cooling and solidifying the first material in said space, thereby forming a block of the first material; a third step of forming a hole in a first end of the block;

a fourth step of supplying a second material for forming a core, into the hole formed in the first end of the block;

a fifth step of cooling and solidifying the second material in said hole, thereby forming a core;

a sixth step of scraping a second end of said block, which is opposite to the first end; and

a seventh step of supplying an additional amount of the first material onto the first end of said block, cooling and solidify-

ing the additional amount of the first material, thereby forming a layer covering the core of the second material.

5,487,095

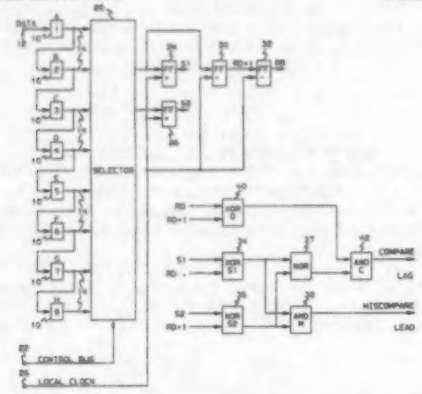
EDGE DETECTOR

Richard C. Jordan, Lake Katrine; Robert S. Capowski, Verbank; Daniel F. Casper, Poughkeepsie; Frank D. Ferraiolo, New Windsor, all of N.Y.; William C. Laviola, Round Rock, Tex., and Peter R. Tomaszewski, Wake Forest, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1994, Ser. No. 262,087

Int. Cl.[6] A04L *7/00*

U.S. Cl. 376—371 **6 Claims**



1. A method for locating a transition in a digital stream with respect to a transition in a clock signal, comprising the steps of:

generating at least three phase shifted versions of said digital data stream;

selecting a first pair of two adjacent phase shifted versions of said digital data stream from said at least three phase shifted versions of said digital data stream;

comparing said first pair of two adjacent phase shifted versions of said digital data stream with said clock signal to determine whether or not a transition of said clock signal falls between transitions of said first pair of two adjacent phase shifted versions of said digital data stream;

selecting a second pair of two adjacent phase shifted versions of said digital data stream from said at least three phase shifted versions of said digital data stream if said comparing step for said first pair of two adjacent phase shifted versions of said digital data stream determines that said clock signal does not fall between transitions of said first pair of two adjacent phase shifted versions of said digital data stream;

repeating said comparing step for said second pair of two adjacent phase shifted versions of said digital data stream; and

repeating said selecting and comparing steps for other pairs of two adjacent phase shifted versions of said digital data stream until a determination is made that said clock signal falls between transitions of a pair of two adjacent phase shifted versions of said digital data stream.

5,487,096

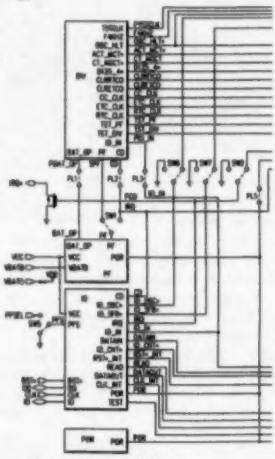
INTEGRATED CIRCUIT WITH REAL TIME, ELAPSED TIME, AND CYCLE COUNTER CLOCKS

Ronald W. Pearson, Denton; Kevin E. Deierling, Dallas, and Clark R. Williams, Plano, all of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 728,230, Jul. 10, 1991, abandoned. This application Jun. 14, 1994, Ser. No. 259,421

Int. Cl.[6] G06M *3/02*

U.S. Cl. 377—15 **7 Claims**



1. An integrated circuit, comprising:

an oscillator which produces tick signals at a constant average frequency;

first counter system connected to said oscillator, which first counter system counts said tick signals to provide a current time value;

a second counter system connected to said oscillator and to a first input pin, which second counter system counts said tick signals only when said first input pin is in a first state;

third counter system connected to a second input pin, which third counter system is incremented each time said second input pin transactions into a second state;

interface circuitry which provides read access to said first, second, and third counter systems; and

a system power input pin and a battery input pin, and wherein said first and second input pins are said system power input pin, and said first state occurs whenever power is applied to said system power supply input pin, and wherein said first counter system is powered from said battery input pin when said system power input pin is not powered.

5,487,097

PERIOD MEASURING DEVICE

Makoto Hatakenaka, Itami; Haruo Sakurai, Nagasaki, and Hideo Nagano, Itami, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1994, Ser. No. 291,285

Claims priority, application Japan, Aug. 23, 1993, 5-207791

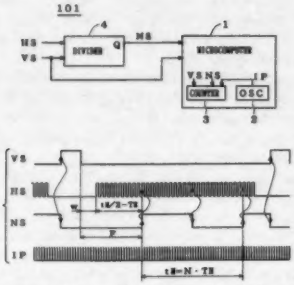
Int. Cl.[6] G01R *23/10*

U.S. Cl. 377—20 **22 Claims**

1. A period measuring device for measuring a period of a first signal which is periodically activated, comprising:

(a) an input terminal for inputting a second signal which has a period larger than that of said first signal and has a predetermined relation with said first signal;

(b) an oscillator for generating a third signal which has a period smaller than that of said first signal;



(c) a first counter for counting the number of times of activation of said third signal in a measurement period determined by said second signal;

(d) operation means for obtaining the period of said first signal from an output of said first counter, the period of said third signal and said predetermined relation; and

(e) a divider for N-dividing said first signal to generate said second signal and supplying it to said input terminal;

wherein said first counter is activated after a fourth signal is detected and said first counter counts the number of times of activation of said third signal during a next full period of the second signal after the fourth signal activates the counter.

5,487,098

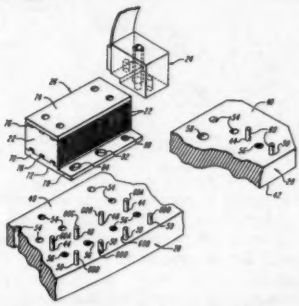
MODULAR DETECTOR ARRANGEMENT FOR X-RAY TOMOGRAPHIC SYSTEM

John Dobbs, Hamilton, and David Banks, Boxford, both of Mass., assignors to Analogic Corporation, Peabody, Mass.

Continuation of Ser. No. 190,945, Feb. 3, 1994, abandoned. This application May 22, 1995, Ser. No. 447,181

Int. Cl.[6] A61B *6/02*

U.S. Cl. 378—19 **41 Claims**



1. A modular arrangement for X-ray detector assembly for use with a source of X-rays in a X-ray system, said arrangement comprising:

at least one detector module, said detector module including a reference surface and one or more detectors, fixed relative to said reference surface, for detecting X-rays generated by said source;

at least one anti-scatter module, said anti-scatter module including a second reference surface and means, fixed relative to said second reference surface, for reducing the amount of scattered X-rays that are received by said detector; and

base support means, adapted to be secured to said X-ray system, for supporting said detector and anti-scatter modules and having a base reference surface and including positioning means for properly positioning and fixing each of said modules to said base support means and with respect to each other;

wherein said positioning means comprises three pins extending through said base reference surface and fixed relative to said base support means such that a first of said pins cooperates with said detector module, the second of said pins cooperates with said anti-scatter module and the third of said pins cooperates with and is common with respect to both said detector and anti-scatter modules so that the reference surfaces of each of said modules is in mutually confronting relationship with the base reference surface and so that the detector module and anti-scatter module are accurately positioned with respect to one another and to said source when said modules and base support means are secured to said X-ray system.

5,487,099

PORTABLE TELEPHONE HAVING AN ADDITIONAL DEVICE FOR MAKING EXTERNAL CONNECTIONS

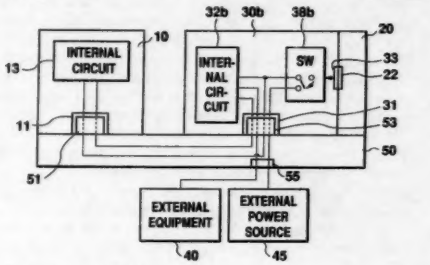
Hitoshi Maekawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 162,964, Dec. 8, 1993, abandoned. This application Sep. 22, 1994, Ser. No. 310,056

Claims priority, application Japan, Jan. 29, 1993, 5-013115

Int. Cl.[6] H04Q *7/32*

U.S. Cl. 379—59 **4 Claims**



1. A portable telephone comprising:

a portable telephone main body having a wireless communication function and means for connecting the telephone main body to a telephone line;

a battery pack for supplying power to said telephone main body; and

an additional device detachably connected between said battery pack and said telephone main body, said additional device comprising:

a connector for making external connections; first connecting means for detachably connecting said additional device to said portable telephone main body;

second connecting meads for detachably connecting said battery pack to said additional device with said additional device being interposed between said battery pack and said telephone main body;

means for interconnecting to said portable telephone main body through said first connecting means a signal supplied to said connector from equipment external to said portable telephone main body while connecting electric power from said battery pack to said portable telephone main body through said first and second connecting means; and

means functioning to store electric power in an additional battery located within said additional device and to supply the power stored in said additional battery to Said portable telephone main body.

5,487,100

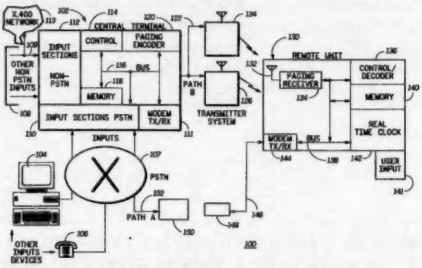
ELECTRONIC MAIL MESSAGE DELIVERY SYSTEM

John R. Kane, Wellington, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 954,179, Sep. 30, 1992, abandoned. This application May 17, 1994, Ser. No. 248,853

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—57 **12 Claims**



1. An electronic mail delivery system comprising:

an electronic mail network for delivering a first message from an originating device to a destination device, the first message including message data and a network address for identifying the originating and destination devices, the network address comprising a first number of characters;

a paging terminal coupled to the electronic mail network for receiving the

first message and automatically generating from the network address therein an alias of the originating device having a second number of characters less than the first number of characters without user intervention further than that required for initiation of the first message, wherein the paging terminal further encodes the message data and the alias, rather than the network address, into a second message for transmission to at least one selective call receiver;

paging transmitting means for transmitting the second message over a paging communication channel; and

at least one portable selective call receiver for receiving the second message over the paging communication channel and for presenting at least the message data of the second message to a user of the at least one portable selective call receiver.

5,487,101

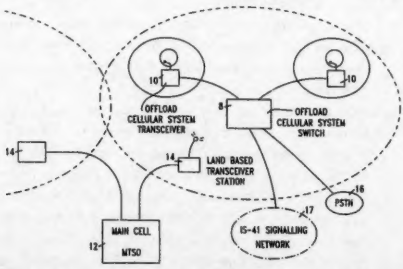
OFF-LOAD CELLULAR SYSTEM FOR OFF-LOADING CELLULAR SERVICE FROM A MAIN CELLULAR SYSTEM TO INCREASE CELLULAR SERVICE CAPACITY

Anthony G. Fletcher, Corinth, Miss., assignor to Celcore, Inc., Memphis, Tenn.

Filed Mar. 26, 1993, Ser. No. 37,170

Int. Cl.[6] H04Q *7/36;7/38*

U.S. Cl. 379—60 **11 Claims**



2. A control system for controlling cellular service between a main cellular system providing cellular service in at least one main cellular service area and an off-load cellular system providing off-load cellular service in an off-load cellular service area that is smaller than and within the at least one main cellular service area, the control system comprising:

a receiver circuit for monitoring the off-load cellular service area and receiving an origination message broadcast from a mobile telephone located in the off-load cellular service area, said receiver circuit having an output for outputting said received origination message;

a controller for receiving said origination message output from said receiver circuit, and for instructing the off-load cellular system whether to provide off-load cellular service to said mobile telephone responsive to said origination message; and

wherein said origination message includes calling information, and said controller determines whether said calling information is valid based upon predetermined criteria, and

when said calling information is valid, said controller instructs the off-load cellular system to provide said off-load cellular service to said mobile telephone, and

when said calling information is invalid, said controller instructs the off-load cellular service not to provide said off-load cellular service and to notify said mobile telephone to tune to the main cellular system, shedding said mobile telephone from the off-load cellular system.

5,487,102

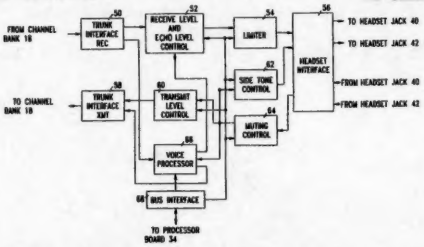
VOICE INTERFACE BOARD FOR USE IN AN OPERATOR SYSTEM

Ralph F. Rothschild, Monsey, N.Y.; George D. Kontopidis, Dedham, and Charles C. Linton, Southboro, both of Mass., assignors to Volt Information Sciences, Inc., New York, N.Y.

Filed Dec. 10, 1992, Ser. No. 988,554

Int. Cl.[6] H04M *1/00;3/00;* **H03G** *3/00*

U.S. Cl. 379—67 **25 Claims**



21. In an operator workstation for use by an operator to service calls from subscribers in a public telephone network, a circuit board for controlling audio characteristics of audio signals in the public telephone network comprising:

an interface for receiving receive analog audio signals from a telecommunications network interface and for transmitting transmit analog audio signals to the telecommunications network interface;

an audio characteristics control circuit coupled to the interface, for adjusting the audio characteristics of the receive and transmit analog audio signals and for recording and generating voice messages to be transmitted to the telecommunications network via the interface, the audio characteristics control circuit further comprising a voice processor coupled to the interface for generating control signals to control the adjustment of at least one of the audio characteristics of the analog audio signals; and

a headset interface coupled to the audio characteristics control circuit for transmitting the adjusted receive analog audio signals from the audio characteristics control circuit to at least one operator headset and for transmitting the analog transmit audio signals from at least one operator headset to the audio characteristics control circuit.

5,487,103

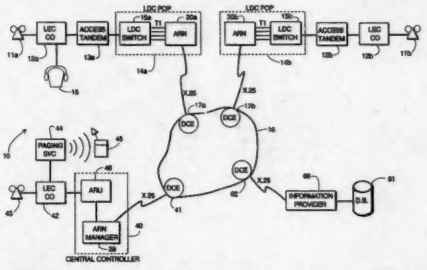
ENHANCED WIDE AREA AUDIO RESPONSE NETWORK

Charles T. Richardson, Jr., Gwinnett County, and Kevin L. Austin, Fulton County, both of Ga., assignors to United States Advanced Network, Inc., Norcross, Ga.

Continuation of Ser. No. 852,491, Mar. 16, 1992, Pat. No. 5,317,627, which is a continuation of Ser. No. 591,047, Oct. 1, 1990, Pat. No. 5,113,430. This application Apr. 12, 1994, Ser. No. 226,560

Int. Cl.[6] H04M *1/64;11/00;3/42*

U.S. Cl. 379—88 **6 Claims**



1. Method of providing voice messaging services to callers from a wide area network system, the method comprising the steps of:

providing and activating a plurality of audio devices located remotely across a wide area network from each other and connected to user telephone lines, and a central device connected to the plurality of audio devices for communicating with the plurality of audio devices;

connecting a caller on a user telephone line to an audio device of the plurality of audio devices;

receiving a destination number and a caller audio message at the audio device;

storing the caller audio message in the audio device;

calling the destination number from the audio device to communicate with a message recipient; and

reproducing to the message recipient the caller audio message from the audio device.

5,487,104

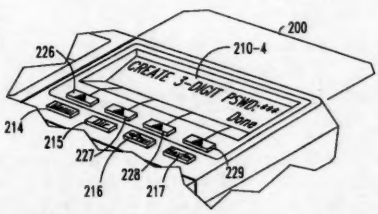
ARRANGEMENT FOR DISPLAYING MENU SCREENS ON A TELEPHONE TERMINAL

Kimberly A. Baals, Matawan; Kathleen J. Chylinski, Bridgewater; Darren A. Kall, Highland Park, and Gary C. Smith, Freehold, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 47,590, Apr. 13, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 363,562

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—96 **22 Claims**



1. An arrangement for displaying menu screens of information messages in a limited available space in a display device at a telephone terminal, the arrangement comprising:

means for generating a plurality of sets of information messages in the telephone terminal, each one of the sets of information messages being displayed in an associated menu screen in said limited available space of said display device; and

means for assigning different tasks for a selected information message, each task requiring movement from a displayed menu screen to another menu screen upon the completion of a specific task for another information message in the set of information messages in said displayed menu screen, and the selected information message being commonly displayed in each one of different sets of information messages.

5,487,105

FACSIMILE APPARATUS OPERABLE IN FACSIMILE OR TELEPHONE MODE

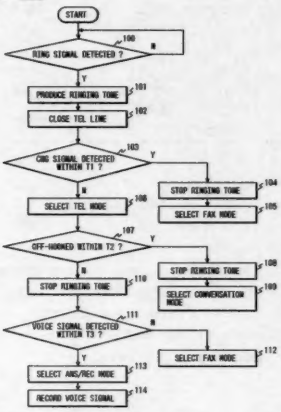
Hajime Sakai, Oonojo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 20, 1993, Ser. No. 169,901

Claims priority, application Japan, Dec. 21, 1992, 4-340017; Dec. 21, 1992, 4-340018; Dec. 21, 1992, 4-340020

Int. Cl.[6] H04M *11/00;1/64*

U.S. Cl. 379—100 **23 Claims**



1. A facsimile apparatus comprising:

telephone line closing means for closing a telephone line in response to receipt of a ring signal;

ringing tone producing means for producing a ringing tone in response to the receipt of the ring signal;

facsimile communication means;

facsimile communication start signal detecting means for detecting a facsimile communication start signal sent through the telephone line;

automatic telephone answering/recording means for sending an outgoing voice message to the telephone line and for recording an incoming voice signal received through the telephone line;

first control means for selecting a facsimile mode to operate said facsimile communication means when said facsimile communication start signal detecting means detects said facsimile communication start signal within a first predetermined time after said telephone line closing means closes the telephone line; and

second control means for selecting a telephone conversation mode when an operation in response to said ringing tone is performed within a second predetermined time after the receipt of said ring signal and for selecting an automatic telephone answering/recording mode to operate said automatic telephone answering/recording means when the operation is not performed in response to said ringing tone within said second predetermined time, said second control means performing said selection between said telephone conversa-

tion mode and said automatic telephone answering/recording mode when said facsimile mode is not selected by said first control means.

5,487,106

COMMUNICATION APPARATUS CAPABLE OF UTILIZING PORTABLE DEVICE

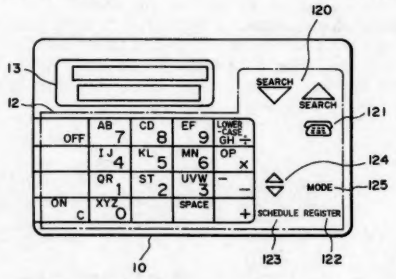
Toshio Kenmochi, and Masao Kiguchi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 633,303, Dec. 24, 1990, abandoned. This application Mar. 8, 1994, Ser. No. 207,111

Claims priority, application Japan, Dec. 26, 1989, 1-339204

Int. Cl.[6] H04M *11/00;1/00*

U.S. Cl. 379—100 **10 Claims**



1. A data transmission apparatus comprising:

receiving means for receiving transmission control data from a portable device;

dialing means for dialing a communication partner's number specified by the transmission control data; and

transmitting means for transmitting confidential communication identification when confidential communication mode data is set in the transmission control data.

5,487,107

METHOD AND APPARATUS FOR PROCESSING TELEPHONE CALLS CHARGED TO CREDIT CARDS

Jean Atkins, Naperville, Ill.; Richard M. Harris, Hoboken; Julie M. Ladieu-Walton, Freehold, both of N.J., and David C. McChristian, Naperville, Ill., assignors to AT&T IPM Corp., Coral Gables, Fla.

Continuation of Ser. No. 918,726, Jul. 22, 1992, Pat. No. 5,287,403. This application Feb. 14, 1994, Ser. No. 195,414

The portion of the term of this patent subsequent to Feb. 15, 2011, has been disclaimed.

Int. Cl.[6] H04M *1/64;11/00;15/00;17/00*

U.S. Cl. 379—144 **15 Claims**

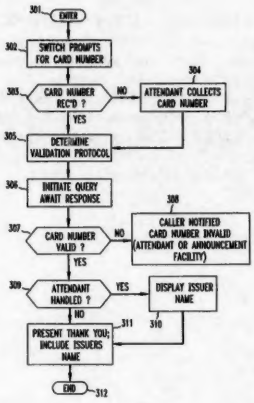
1. A method for use in processing telephone calls that are charged to cards, each of said cards being identified by an associated card number and each being issued by a respective one of a plurality of card issuers, the method comprising the steps of:

receiving a card number supplied by a caller;

identifying the issuer of said card from said card number;

validating said card number; and

responsive to said identifying, supplying to said caller an announcement including the name of said card issuer identified in said identifying step and the name of a carrier carrying the call.



5,487,108

PROGRAMMABLE DIALLER FOR A MOBILE TELEPHONE

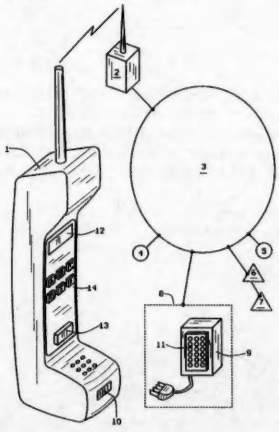
Richard S. Atkins, Ipswich, United Kingdom; Tommy W. Gibson, Tifton, Ga., and Philip P. Ransome, Port St Mary, United Kingdom, assignors to AGR Industries Limited, United Kingdom

Filed Jul. 24, 1992, Ser. No. 919,729

Claims priority, application United Kingdom, Jul. 25, 1991, 9116073

Int. Cl.[6] H04M *1/57*

U.S. Cl. 379—355 **8 Claims**

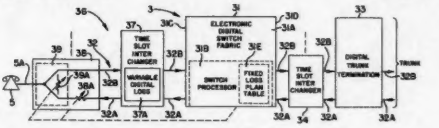


1. A dialler for a cellular mobile telephone instrument including a key or keys arranged, on actuation, to send a code to a memory which results in an initiation of a telephone call to a respective predetermined authorized telephone number embedded in the dialler, wherein the predetermined authorized telephone number or numbers associated with the keys are configured to be set or changed only by using coding means external to the telephone instrument.

5,487,109
END OFFICE OF A TELEPHONE SYSTEM WITH A ZERO LOSS PLAN

Robert A. Sutton, Montevallo, Ala., assignor to BellSouth Corporation, Atlanta, Ga.

Filed May 17, 1994, Ser. No. 245,457
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—410 **17 Claims**



1. An end office of a telephone system,

said end office continuing calls to and from subscriber locations connected to the end office and comprising:

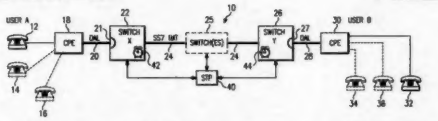
an electronic digital switch having a line side and a trunk side, said trunk side of said electronic digital switch adapted to be connected to a trunk;

and line side equipment connected to the line side of said electronic digital switch, said line side equipment having a transmit path and a receive path associated with a subscriber location and being exclusive of means for introducing analog and digital loss into said receive path for reducing echo signals in said receive path.

5,487,110
APPARATUS AND METHOD FOR VIRTUAL PRIVATE TELEPHONE LINE WITH AUTOMATIC RING DOWN

Paul M. Bray, Garland; Douglas R. Cardy, Plano, and Charles P. Shelton, McKinney, all of Tex., assignors to DSC Communications Corporation, Plano, Tex.

Filed Feb. 1, 1994, Ser. No. 189,904
Int. Cl.[6] H04M *7/10*
U.S. Cl. 379—220 **9 Claims**



1. Apparatus for a virtual private telephone connection between a User A telephone equipment and a User B telephone equipment, comprising:

a first telephone switch coupled to said User A telephone equipment, said first telephone switch capable for switching a plurality of trunk groups including at least one virtual private line trunk group, said at least one virtual private line trunk group including one or more trunk circuit;

a second telephone switch coupled to said first telephone switch and further coupled to said User B telephone equipment, said second telephone switch capable for switching a plurality of trunk groups including at least one virtual private line trunk group, said at least one virtual private line trunk group including one or more trunk circuit;

a database accessible by said first and second telephone switches, said database being capable of associating said virtual private line trunk group of said first switch with said virtual private line trunk group of said second switch;

said first and second telephone switches processing virtual private telephone connections between said User A and User B telephone equipment;

means coupled to said User A telephone equipment for detecting said User A telephone being on-hook;

means for transmitting an SS7 Suspend message to said second telephone switch in response to said User A telephone being on-hook;

a suspend timer residing in said first telephone switch for beginning timing in response to said User A telephone being on-hook, said suspend timer expiring after a predetermined amount of time;

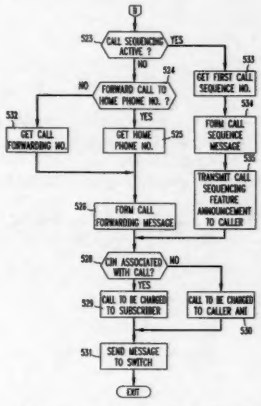
means for detecting said User A telephone being off-hook prior to the expiration of said suspend timer and alerting said first switch accordingly; and

means residing in said first telephone switch for transmitting an SS7 Resume message to said second telephone switch in response to the alert from said detecting means and reestablishing the virtual private line connection.

5,487,111
TELECOMMUNICATIONS SYSTEM SEQUENCE CALLING

Ronald D. Slusky, Highland Park, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Filed Jul. 29, 1993, Ser. No. 99,114
Int. Cl.[6] H04M *1/72*
U.S. Cl. 379—211 **20 Claims**



1. A method, for use in a telecommunications system, for automatically routing a call made to a particular called number in accordance with a previously stored sequence of telephone numbers, the method comprising the steps of:

retrieving said sequence of telephone numbers in response to receipt of said called number, and

in response to a signal supplied by said caller, routing said call to a particular one of said telephone numbers of the retrieved sequence even if said call was completed to a previous telephone number in said sequence.

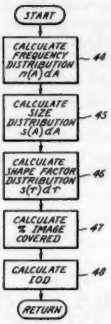
5,487,112
METHOD AND APPARATUS FOR TIME-RESOLVED MEASUREMENTS OF LYMPHOCYTE FUNCTION AND AGGREGATE STRUCTURE USING COMPUTER-AUTOMATED MICROSCOPY

Kyriacos Zygourakis; John L. Bednarczyk; Bradley W. McIntyre, and Michael W. Glacken, all of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Feb. 20, 1990, Ser. No. 483,038
Int. Cl.[6] G06K *9/00;* **G06F** *15/00;* **G01N** *33/48*
U.S. Cl. 382—6 **12 Claims**

1. A method of characterizing the structure of cells and aggregates of cells in a cell suspension, including the steps of:

incubating a cell suspension and reagent to produce non-aggregated cells and aggregates of cells;



producing at least one image of said non-aggregate cells and aggregates of cells;

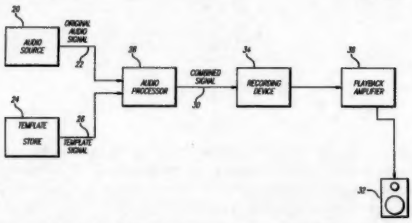
characterizing an extent of aggregation of said cell suspension according to a ratio of a total area of said at least one image covered by sells and cell aggregates to total area of said at least one image covered by non-aggregated cells before aggregation begins.

5,487,113

METHOD AND APPARATUS FOR GENERATING AUDIOSPATIAL EFFECTS

Steven D. Mark, Newport Beach, and David Doleshal, Lido Isle, both of Calif., assignors to Spheric Audio Laboratories, Inc., Santa Ana, Calif.

Filed Nov. 12, 1993, Ser. No. 151,362
Int. Cl.[6] H04R *3/00*
U.S. Cl. 381—17 **65 Claims**



1. A method for producing one or more desired three-dimensional audiospatial effects in an original audio signal, said method comprising the steps of:

generating a noise signal having one or more amplitude variations introduced at selected frequencies, said frequencies and amplitude variations being selected so as to yield the desired three-dimensional audiospatial effects; and

applying said noise signal to said original audio signal, thereby producing the desired three-dimensional audiospatial effects.

5,487,114

MAGNETLESS SPEAKER

Khanh Dinh, 1618 SW. 76th Ter., Gainsville, Fla. 32607

Filed Feb. 2, 1994, Ser. No. 191,325
Int. Cl.[6] H04R *25/00*
U.S. Cl. 381—192 **5 Claims**

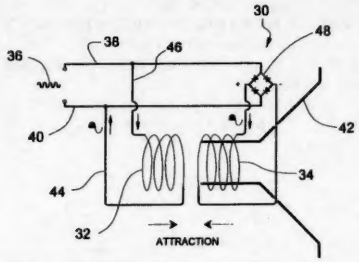
1. A magnetless speaker comprising:

A. a frame;

B. a movable membrane supported on said frame;

C. first and second conductors connected to an amplifier;

D. a stationary coil mounted on said frame and having first and second leads connected to said first and second conductors so as to be powered directly by said amplifier;



E. a bridge rectifier having (1) first and second leads connected to said first and second conductors in parallel with said first and second leads of said stationary coil and (2) third and fourth leads; and

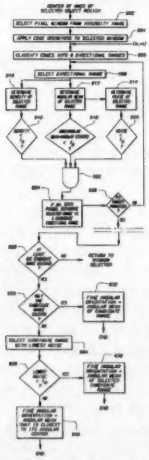
F. a movable coil mounted on said membrane in close proximity to said stationary coil and having first and second leads connected to said third and fourth leads of said bridge rectifier so as to be powered indirectly by said amplifier, wherein said stationary and movable coils produce interacting magnetic fields upon excitation by said amplifier, thereby causing said membrane to vibrate and to produce sound without the action of an auxiliary power source and without the action of a permanent magnet.

5,487,115

METHOD AND APPARATUS FOR DETERMINING THE FINE ANGULAR ORIENTATION OF BAR CODE SYMBOLS IN TWO-DIMENSIONAL CCD IMAGES

Stefan Surka, Sandy Hook, Conn., assignor to United Parcel Service, Atlanta, Ga.

Continuation-in-part of Ser. No. 883,853, May 14, 1992, abandoned. This application Aug. 17, 1993, Ser. No. 108,086
Int. Cl.[6] G06K *9/32*
U.S. Cl. 382—296 **34 Claims**



1. A method for determining the fine angular orientation of a bar code symbol in a two-dimensional pixel image comprising the steps of:

(A) selecting a window from said two-dimensional image for processing;

(B) determining an edge magnitude and an edge direction for a plurality of pixels in said selected window;

(C) selecting a pixel from said plurality of pixels;

(D) if said edge magnitude associated with said selected pixel exceeds a first predetermined threshold, then associating said

edge magnitude and said edge direction of said selected pixel with at least one of a plurality of directional ranges;

(E) repeating steps (C)–(D) for each pixel in said plurality of pixels;

(F) selecting one directional range from said plurality of directional ranges;

(G) determining a density value associated with said selected directional range in accordance with the number of pixels associated with said selected directional range;

(H) repeating steps (F)–(G) for each of said plurality of directional ranges;

(I) selecting at least one candidate directional range in accordance with said associated density values; and

(J) determining said fine angular orientation in accordance with said edge directions associated with said at least one candidate directional range.

5,487,116

VEHICLE RECOGNITION APPARATUS

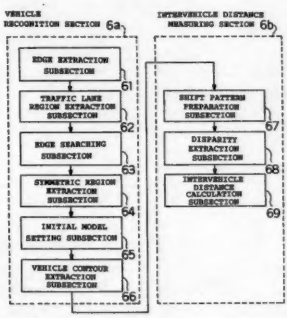
Nobuyuki Nakano, Hirakata, and Nobuhiko Yasui, Moriguchi, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 20, 1994, Ser. No. 246,634

Claims priority, application Japan, May 25, 1993, 5-147025; Nov. 8, 1993, 5-277217

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—104 **5 Claims**



1. A vehicle recognition apparatus which recognizes a preceding vehicle from road images input by use of vehicle-mounted video cameras and measures a distance to the recognized vehicle, comprising:

stereo image input means mounted on a vehicle for picking up stereo road scenes in front of the vehicle;

image storage means for storing the road scenes information input from said stereo image input means;

edge extraction means for applying a differential processing to the road scenes information stored in said image storage means, to thereby extract edges;

traffic lane region extraction means for extracting a traffic lane region from the road scenes information stored in said image storage means;

vehicle edge searching means for producing a histogram by projecting edges which are extracted by said edge extraction means and are included within the traffic lane region extracted by said traffic lane region extraction means, to thereby produce axes of the image, said vehicle edge searching means further provided for extracting a position at which the histogram converges as an edge of a preceding vehicle existing region candidate;

symmetric region extraction means for extracting a symmetric region within the preceding vehicle existing region candidate defined by said vehicle edge searching means and for further limiting the preceding vehicle existing region candidate;

initial model setting means for setting an initial contour model for the preceding vehicle from a ratio of a width and height of the preceding vehicle existing region candidate defined by said symmetric region extraction means, said initial model setting means further provided for selecting an initial model having a most adequate configuration among prepared models having various configurations, said initial model setting means further expanding or compressing the selected initial model based on a size of the preceding vehicle existing region candidate, such that a center of the expanded or compressed initial model coincides with a center of the preceding vehicle existing region candidate;

contour extraction means for defining various features of the preceding vehicle as an energy function, the features being present in the road scenes information stored in said image storage means, said contour extraction means further provided for dynamically transforming the initial model obtained from said initial model setting means by evaluating the energy function, to obtain a closer contour of the preceding vehicle; and

intervehicle distance measuring means for measuring a distance to the preceding vehicle on the basis of the contour of the preceding vehicle extracted by said contour extraction means.

5,487,117

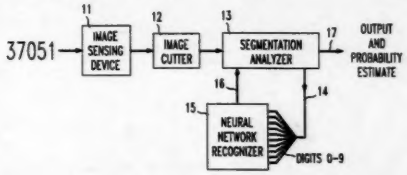
GRAPHICAL SYSTEM FOR AUTOMATED SEGMENTATION AND RECOGNITION FOR IMAGE RECOGNITION SYSTEMS

Christopher J. Burges, Freehold; Yann A. Le Cun, Lincroft, both of N.J., and Ofer Matan, Escondido Village, Calif., assignors to AT&T Corp, Murray Hill, N.J.

Continuation of Ser. No. 227,082, Apr. 8, 1994, abandoned, which is a continuation of Ser. No. 816,415, Dec. 31, 1991, abandoned. This application Oct. 11, 1994, Ser. No. 327,339

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—173 **29 Claims**



1. In symbol recognition apparatus comprising an image sensor, an image segmenter, a memory, a recognizer including a library of known images and a comparison means for generating a measure of probability that a sensed image is a one of said known images, the improvement in recognizing one or more unknown alphanumeric symbols, comprising:

means for sensing an image of said symbol string with said image sensor;

means for segmenting the image of said symbol string with said segmenter to construct candidate cuts through said string, thereby creating a multiplicity of image segments potentially greater in number than the symbols present in said string and sufficient in number to include the correct segmentation;

means for arranging in said memory said segments as a sequence of nodes, the nodes at the beginning point of said sequence corresponding to the left-hand side of said string, and the nodes at the end-point in said sequence corresponding to the right-hand side of said string;

means for identifying all nodes corresponding to segments which are legal neighbors and connecting with arcs from left to right all such nodes, thereby creating multiple paths across said sensed image, each said path corresponding to a particular legal segmentation of said image;

means for comparing said segments to predetermined data in a definite cut database thereby to identify all nodes which straddle a definite cut;

means for eliminating from said memory said last-named nodes as well as all arcs connected to each said node;

means for identifying nodes which because of the preceding step no longer have a parent-child connection, and recursively eliminating all said nodes and associated arcs from said memory;

means for generating in said recognizer a measure of probability for each remaining node returning said measure to said memory for association with the respective node; and

means for combining said probability measures associated with all of the nodes in each said remaining node path, thereby to produce outputs consisting of a symbol identification and a total probability measure associated with each particular node path.

5,487,118

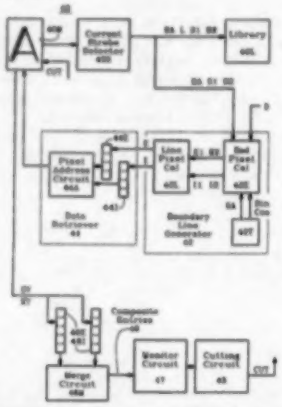
SEQUENTIAL EXTRACTION OF STROKES FROM A STROKE BASED SYMBOL APPARATUS AND METHOD

Roger D. Melen, Los Altos Hills, Calif., assignor to Canon Inc., Tokyo, Japan

Continuation of Ser. No. 787,615, Nov. 4, 1991, abandoned. This application Apr. 8, 1994, Ser. No. 224,786

Int. Cl.[6] G06K *9/46*

U.S. Cl. 382—202 **19 Claims**



1. The computer-implemented method of extracting an individual stroke from a pixel bit map of a stroke based symbol, said method comprising the steps of:

providing, within a storage area of a computer, a pixel bit map of the stroke based symbol formed by

stroke pixels having stroke status forming fixed node regions of contiguous node pixels common to a stroke and one or more other strokes within the stroke based symbol,

and by

stroke pixels having stroke status forming fixed body regions of contiguous body pixels unique to a stroke,

and by

background pixels having background status forming non-stroke areas between strokes;

selecting an individual stroke to be extracted from the stroke based symbol;

defining a pair of straight detection boundary lines each formed by a series of boundary pixels along each side of the individual stroke to be extracted, the boundary lines being displaced from the individual stroke and extending parallel to the individual stroke, each boundary pixel in one boundary line having a corresponding pixel in the other boundary line;

monitoring the status of the boundary pixels to determine the presence and location of

stroke pixels from strokes outside of the individual stroke to be extracted indicating the presence of node regions within the individual stroke,

and

background pixels from non-stroke areas outside of the individual stroke to be extracted indicating the presence of body regions within the individual stroke;

causing the computer to cue body regions of the individual stroke to be extracted from the bit map of the stroke based symbol by deleting pixels forming the body regions; and

protecting the node regions of the individual stroke to be extracted from cutting by not deleting node pixels.

5,487,119

METHOD OF DETERMINING QUANTIZATION STEP IN A SUBBAND CODING SYSTEM

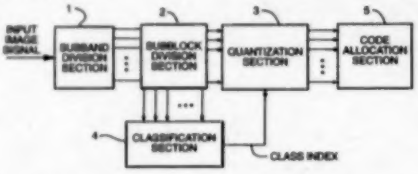
Shunichi Kimura; Yutaka Koshi, and Koh Kamizawa, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1994, Ser. No. 306,490

Claims priority, application Japan, Sep. 17, 1993, 5-232074

Int. Cl.[6] G06K *9/36*

U.S. Cl. 382—239 **2 Claims**



1. An image coding method for an image coding apparatus which includes a subband division section for dividing an input image signal into a plurality of subband signals having frequency bands different from each other and having predetermined bit numbers distributed individually thereto, a subblock division section for dividing the subband signals obtained from said subband division section into a plurality of subblocks each having a spatial spread, a classification section for classifying the subband signals for each of the subblocks obtained from said subblock division section, a quantization section for quantizing the subband signals for each of the subblocks obtained from said subblock division section by linear quantization and outputting a quantization index, quantization by said quantization section being performed with a step width determined in response to a class outputted from said classification section, and a code allocation section for allocating the quantization index from said quantization section as a codeword, said image coding method comprising the steps of:

calculating, for each subblock, boundary points of the quantization step corresponding to the number of bits required for quantization in response to the dynamic range of signals of the subblock;

re-arranging the boundary points of the quantization steps of all of the subblocks in the class in order beginning with that of the greatest quantization step; and

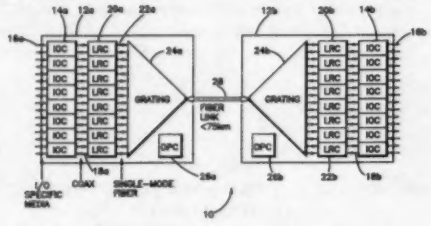
successively adding the corresponding bit numbers beginning with that of the greatest quantization step and determining the quantization step when the sum reaches a required bit number as the quantization step of the class for use in said quantization section.

5,487,120

OPTICAL WAVELENGTH DIVISION MULTIPLEXER FOR HIGH SPEED, PROTOCOL-INDEPENDENT SERIAL DATA SOURCES

Michael M. Choy, Hsinchu, Taiwan, Prov. of China; Paul E. Green, Jr., Mt. Kisco, N.Y.; William E. Hall, Clinton; Frank J. Janniello, Stamford, both of Conn.; Jeff K. Kravitz, Yorktown Heights, N.Y.; Karen Liu, Montclair, N.J.; Rajiv Ramaswami, Ossining, N.Y., and Franklin F. Tong, Stamford, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1994, Ser. No. 193,969
Int. Cl.[6] G02B *6/00;6/36*
U.S. Cl. 385—24 12 Claims



1. Communications apparatus, comprising:

a plurality of input/output (I/O) interface units, each of said I/O interface units including means for coupling to a communications network for receiving a signal from the network and for transmitting a signal to the network, each of said I/O interface units further including an input buffer means having an input for receiving a first electrical signal representing information to be transmitted to the network, each of said I/O interface units further including an output buffer means having an output for providing a second electrical signal representing information received from the network;

a plurality of optical transmitter and receiver units each including an optical transmitter means and an optical receiver means, individual ones of said optical transmitter and receiver units being coupled to one of said I/O interface units for providing said first electrical signal thereto and for receiving said second electrical signal therefrom, said second electrical signal being supplied to said optical transmitter means for modulating an output thereof, said first electrical signal being output from said optical receiver means, each of said optical transmitter and receiver units having an optical transmitter means that generates an optical signal that differs in wavelength from others of said optical transmitter means; and

optical multiplexing and demultiplexing means having a plurality of inputs, individual ones of said inputs being coupled to an output of an optical transmitter means of one of said optical transmitter and receiver units, said optical multiplexing and demultiplexing means further having a plurality of outputs, individual ones of said outputs being coupled to an input of an optical receiver means of one of said optical transmitter and receiver units, said optical multiplexing and demultiplexing means having a port for bidirectionally coupling to an optical fiber and operating to wavelength division multiplex said inputs from said plurality of optical transmitter means before application to the optical fiber and to wavelength division demultiplex optical signals received from the optical fiber and to separately provide demultiplexed optical signals to said plurality of outputs; wherein

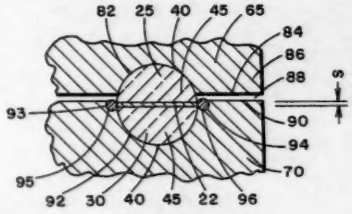
at least two of said I/O interface units are coupled to networks that operate with different network protocols.

5,487,121

OPTICAL SIGNAL COUPLING APPARATUS

Edward J. Miesak, Orlando, Fla., assignor to University of Central Florida, Orlando, Fla.

Filed Dec. 20, 1994, Ser. No. 359,702
Int. Cl.[6] G02B *6/26*
U.S. Cl. 385—39 14 Claims



1. An optical coupler comprising:

a transmitter optical fiber member including a generally curved upper surface and a substantially flat lower surface running lengthwise along the transmitter optical fiber member, the transmitter optical fiber member including an input end;

a first cladding layer situated on the upper surface of the transmitter optical fiber member;

a receiver optical fiber member including a generally curved lower surface and a substantially flat upper surface running lengthwise along the receiver optical fiber member, the receiver optical fiber member including an output end;

a second cladding layer situated on the lower surface of the transmitter optical fiber member, the flat surface of the receiver optical fiber member being oriented to face the flat surface of the transmitter optical fiber member in spaced apart relationship thereto; and

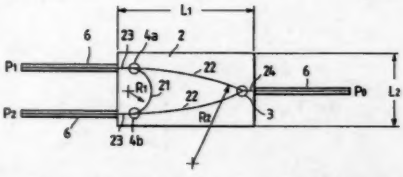
an index matching member situated between the flat surface of the receiver optical fiber member and the flat surface of the transmitter optical fiber member to couple light from the transmitter optical fiber member to the receiver optical fiber member while permitting the transmitter optical fiber member to move with respect to the receiver optical fiber member.

5,487,122

STAR COUPLER INCLUDING WAVEGUIDES HAVING DIFFERENT RADIUS OF CURVATURES

Takeshi Ota, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1993, Ser. No. 15,161
Claims priority, application Japan, Feb. 12, 1992, 4-025407
Int. Cl.[6] G02B *6/28*
U.S. Cl. 385—46 12 Claims

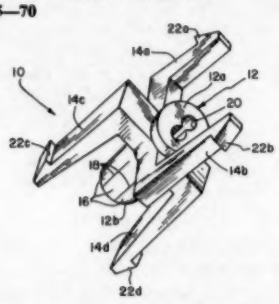


1. A star coupler comprising first, second and third waveguides, each of said second and third waveguides being curved so as to have a radius of curvature, said second and third waveguides branching from said first waveguide and said second waveguide having a different radius of curvature than said third waveguide.

5,487,123
CONNECTORS FOR OPTICAL FIBERS INCLUDING RESILIENT/EXPANDABLE MEMBERS

Juliana V. Fowble, Ithica, N.Y., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Oct. 31, 1994, Ser. No. 332,303
Int. Cl.[6] G02B *6/38*
U.S. Cl. 385—70 **20 Claims**



1. A connector for securing a first optical member to a mounting member so as to align the first optical member with a second optical member, the connector comprising:

a body having a longitudinal axis, a first end and an oppositely disposed second end located on the longitudinal axis;

an internal passage formed within the body along the longitudinal axis, the internal passage being tapered so as to have a smaller cross-section at the second end than at the first end, the internal passage at the first end being sized to receive the first optical member;

expandable members formed at the second end of the body so as to enable the internal passage at the second end to radially expand to accommodate the first optical member;

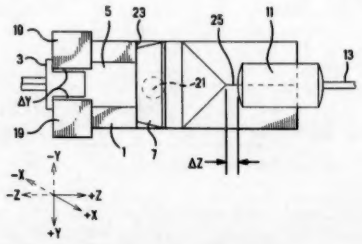
a pair of resilient members extending from the body, each of the pair of resilient members having a longitudinal portion extending towards one of the first and second ends of the body; and

retention means disposed on the longitudinal portion of each of the pair of resilient members for engaging and securing the pair of resilient members to a corresponding feature formed in the mounting member.

5,487,124
BIDIRECTIONAL WAVELENGTH DIVISION MULTIPLEX TRANSCEIVER MODULE

Terry P. Bowen, Etters; Warren H. Lewis, Elizabethtown, both of Pa., and Richard C. Bergstrom, Morgan Hill, Calif., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 30, 1994, Ser. No. 269,428
Int. Cl.[6] G02B *6/36*
U.S. Cl. 385—93 **29 Claims**



1. A compact optical transceiver comprising:

a mounting block including at least first and second positioning grooves formed therein;

a light generating means, abutting a first end of the mounting block, for generating light of a first wavelength;

a light focusing means, mounted to the mounting block, for receiving and focusing the generated light to an optical fiber;

a beamsplitting means, mounted in the first positioning groove of the mounting block, for receiving and passing the generated light of the first wavelength and for receiving and deflecting light of a second wavelength different from the first wavelength;

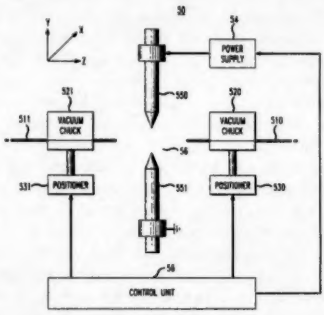
a detecting means, abutting the mounting block, for receiving and detecting the deflected light of the second wavelength; and

a ferrule, attachable to the optical fiber and supported in the second positioning groove of the mounting block, for receiving the focused light of a first wavelength passed through the beamsplitting means and for outputting light of a second wavelength from the optical fiber to the beamsplitting means.

5,487,125
METHOD AND APPARATUS FOR FUSION SPLICING OPTICAL FIBERS

Guenther W. Kammlott, Watchung; Sandra G. Kosinski, Murray Hill; John T. Krause, New Providence, and Richard S. Riggs, Branchburg Township, Somerset County, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Division of Ser. No. 267,704, Jun. 28, 1994. This application Nov. 2, 1994, Ser. No. 333,566
Int. Cl.[6] G02B *6/36*
U.S. Cl. 385—96 **4 Claims**



1. An optical fiber splicing apparatus comprising:

a fiber-holder for holding an end portion of each of two lengths of optical fiber;

an aligning member for aligning the ends of the fibers in a linearly opposing manner;

at least two electrodes, the electrodes having associated therewith a rate of particle emission, including an initial rate of particle emission at the time an electric arc is started;

a power supply for maintaining an electrical arc between the at least two electrodes;

a control unit for initiating an electric arc between the at least two electrodes for at least a time t_c when the fiber holder has the fiber ends positioned outside the electric arc-forming space, where t_c is the time at which the rate of particle emission from the at least two electrodes is 50% of the initial rate of particle emission, the control unit moving the fiber ends within the electric arc-forming space after at least time t_c.

5,487,126

OPTICAL CABLE AND PROCESS FOR PRODUCING THE SAME

Ulrich Oestreich, München, and Reiner Schneider, Ebersdorf b. Coburg, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

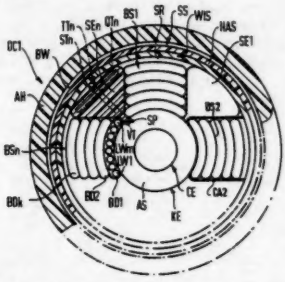
PCT No. PCT/DE93/00146, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO93/18424, PCT Pub. Date Sep. 16, 1993

PCT Filed Feb. 19, 1993, Ser. No. 295,812

Claims priority, application Germany, Mar. 3, 1992, 42 06 652.2

Int. Cl.[6] G02B *6/44;* **B21F** *17/00*

U.S. Cl. 385—105 **39 Claims**



1. An optical cable comprising: a core element, a plurality of ribbon stacks, each stack being formed by a plurality of optical waveguide ribbons, said stacks being arranged in at least one layer around said core element and supporting elements adjacent to the ribbon stacks said supporting elements being designed as independent profiles and each of said supporting elements being arranged in the interspace between two adjacent ribbon stacks, said supporting elements extending in radial direction at least as far as the ribbon stacks and lying with their inner ends on the core element such that said supporting elements contribute for positionally securing the ribbon stacks relative to each other.

33. A method for producing an optical cable comprising the steps of:

supplying a plurality if ribbon stacks, each of said stacks being formed by at least one layer of optical waveguide ribbons;

attaching the plurality of ribbon stacks to a core element; and

supplying and securing support elements into interspaces between adjacent ribbon stacks on the core element to secure the ribbon stacks in position relative to each other.

5,487,127

RAPID THERMAL HEATING APPARATUS AND METHOD UTILIZING PLURALITY OF LIGHT PIPES

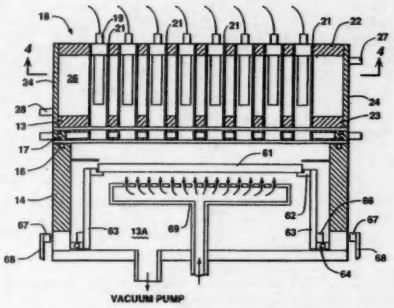
Christian M. Gronet, and James F. Gibbons, both of Palo Alto, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 882,656, May 13, 1992, Pat. No. 5,317,492, which is a division of Ser. No. 781,632, Oct. 24, 1991, Pat. No. 5,155,336, which is a continuation of Ser. No. 467,808, Jan. 19, 1990, abandoned. This application Oct. 5, 1993, Ser. No. 131,830

Int. Cl.[6] H05B *3/40;* **C23C** *16/00;* **H01L** *21/00*

U.S. Cl. 392—416 **9 Claims**

1. A vacuum chamber window assembly comprising a plurality of short light pipes brazed to upper and lower flange plates adapted to be sealed to at least one wall of a vacuum chamber and sealed between two thin quartz window plates.



5,487,128

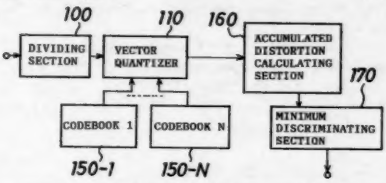
SPEECH PARAMETER CODING METHOD AND APPPARATUS

Kazunori Ozawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 26, 1992, Ser. No. 841,726

Int. Cl.[6] G10L *5/00;9/14*

U.S. Cl. 395—2.31 **7 Claims**



1. A speech parameter coding method, comprising the steps of:

receiving an input speech signal;

dividing the received speech signal into a plurality of frames each of a predetermined time length;

finding spectrum parameters, each of which corresponds to first to P-th order, of the speech signal for each of the frames;

dividing the spectrum parameters into a plural number of said spectrum parameters in accordance with their orders;

searching a spectrum codebook for the divided spectrum parameters and calculating a distortion due to quantizing by use of codevectors in said codebook to obtain a plurality of candidate codevectors.

5,487,129

SPEECH PATTERN MATCHING IN NON-WHITE NOISE

Omri Paiss, Tel Aviv; Ilan D. Shallom, Ashdod; Felix Flomen, Rishon Lezion, and Raziel Haimi-Cohen, Jerusalem, all of, Israel, assignors to The DSP Group, San Jose, Calif.

PCT No. PCT/US92/06351, § 371 Date Jun. 13, 1994, § 102(e) Date Jun. 13, 1994, PCT Pub. No. WO93/03480, PCT Pub. Date Feb. 18, 1993

PCT Filed Jul. 30, 1992, Ser. No. 190,087

Claims priority, application Israel, Aug. 1, 1991, 99041

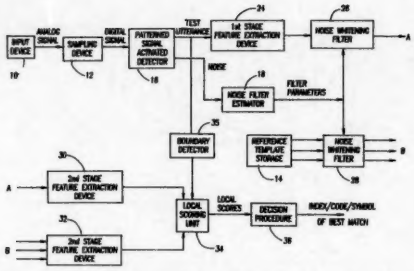
Int. Cl.[6] G10L *9/00*

U.S. Cl. 395—2.42 **33 Claims**

1. A system for matching an input signal, comprising non-white noise and a patterned signal corrupted by said non-white noise, to a plurality of reference signals, said system comprising:

an estimator estimating noise features of said non-white noise and producing from said noise features at least one noise whitening filter;

a filter filtering said input signal and said plurality of reference signals using said at least one noise whitening filter and producing a filtered input signal, having a white noise component, and a plurality of filtered reference signals; and



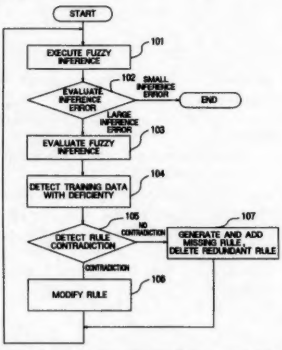
a pattern matcher for matching said filtered input signal to one of said filtered reference signals.

5,487,130

FUZZY RULE ACQUISITION METHOD AND APPARATUS FOR FUZZY INFERENCE SYSTEM AND FUZZY INFERENCE SYSTEM USING THE APPARATUS

Toshihide Ichimori, Kawasaki; Akira Maeda, Yokohama; Motohisa Funabashi, Sagamihara, and Toshihiko Nakano, Ibaraki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1993, Ser. No. 140,665
Claims priority, application Japan, Jan. 22, 1992, 4-284179
Int. Cl.[6] G06F *15/18;15/00*
U.S. Cl. 395—3 **15 Claims**



1. A fuzzy rule acquisition method for a fuzzy inference system in which a fuzzy inference is achieved based on a fuzzy knowledge including fuzzy rules, each of the fuzzy rules described in a format having an IF part and a THEN part, and membership functions defining meanings of propositions described in the IF part and the THEN part, said fuzzy rule acquisition method comprising the steps of:

(a) executing a fuzzy inference for at least one input value by using said fuzzy rules of said fuzzy knowledge, and obtaining a result of the execution of the fuzzy inference;

(b) comparing the result of the execution of the fuzzy inference with a teaching value, and obtaining an inference error;

(c) obtaining errors of said fuzzy rules by using said inference error by referring to at least one of combinations of IF parts of said fuzzy rules, combinations of THEN parts of said fuzzy rules, and both of the combinations of the IF part and the THEN part of said fuzzy rules;

(d) determining whether a pair of said fuzzy rules are mutually contradictory, based on a pair of errors corresponding to said pair of fuzzy rules, by comparing the errors of each pair of fuzzy rules among all pairs of said fuzzy rules;

(e) determining each pair of fuzzy rules as contradictory rules if a ratio between the errors of each pair of fuzzy rules is within a predetermined range and one of the errors is negative and the other of the errors is positive;

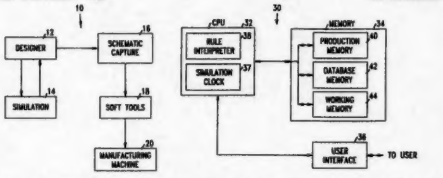
(f) modifying a fuzzy rule determined as contradictory to dissolve the contradiction by comparing the areas corresponding to the IF parts of each pair of fuzzy rules determined as contradictory and modifying the IF part of the fuzzy rule determined as having a larger area by the comparison result.

5,487,131

METHOD FOR ANALYZING THE FLOW OF DATA THROUGH A COMPLEX INFORMATION EXCHANGE SYSTEM

Amal A. Kassatly, Shrewsbury; Taylor S. Chaney, Arlington, and Peter Floss, Graton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 511,560, Apr. 20, 1990, abandoned. This application Dec. 9, 1991, Ser. No. 804,481
Int. Cl.[6] G06F *15/18*
U.S. Cl. 395—62 **10 Claims**



1. A computer implemented method for analyzing information flows in an information exchange system, the information exchange system comprises a plurality of processes intercoupled by a plurality of data paths, comprising the steps of:

(a) developing a model of the information exchange system based upon behavior of the plurality of processes utilizing computer implemented objects to respectively represent the plurality of processes in the information exchange system being modeled and events that occur in the information exchange system;

(b) simulating the information exchange system being modeled to emulate the information flows by transferring messages between the objects, the messages being representative of information transferred between the plurality of processes in the information exchange system;

(c) storing the messages;

(d) locating stored messages that satisfy preconditions of a plurality of rules; and

(e) executing each one of the plurality of rules whose preconditions were satisfied in step (d) to identify optimal data paths for information flows in the information exchange system.

5,487,132

END USER QUERY FACILITY

Viktor C. H. Cheng, 164 Lentor Loop #07-01, Singapore 2678, Singapore

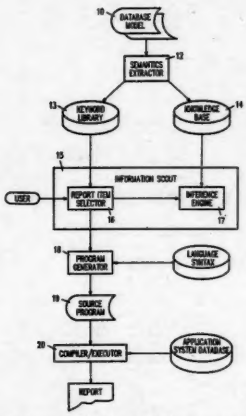
Continuation of Ser. No. 154,343, Nov. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 846,522, Mar. 4, 1992, Pat. No. 5,325,465. This application Nov. 30, 1994, Ser. No. 348,742
Int. Cl.[6] G06F *15/18*
U.S. Cl. 395—63 **37 Claims**

1. An end user query facility for accessing a database having a plurality of database files formed using a database model, comprising:

a knowledge base which stores key-types of items of said database files and a set of linkages of the database model;

a keyword library which stores a set of keywords of said database model representative of items of said database files;

a semantics extractor for reading said database model and extracting the semantics of said database model, and which



stores in said knowledge base said key-types of items and said set of linkages and which stores in said keyword library said set of keywords;

an information scout for interfacing with a user to obtain from the user a designation of the information to be extracted from said database;

an inference engine which, based upon said designation of information to be extracted from said database, identifies one or more of said database files which Contain the desired information and searches said knowledge base to determine the linkage(s) connecting said one or more identified files;

a program generator which accesses the linkages obtained by said inference engine and generates a program to extract said desired information from said database; and

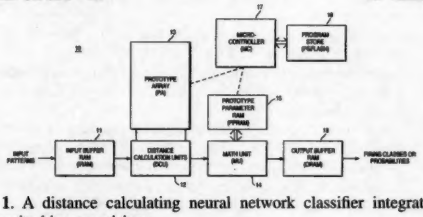
a model purifier for interfacing with a user to alter said key-types of items and said set of linkages in the knowledge base.

5,487,133

DISTANCE CALCULATING NEURAL NETWORK CLASSIFIER CHIP AND SYSTEM

Chin S. Park; Mark A. Holler, both of Palo Alto; Jay M. Diamond, San Jose; Siang-Chun The, Fremont, all of Calif.; Umberto Santoni, Scottsdale, Ariz., and Kenneth R. Buckmann, San Jose, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jul. 1, 1993, Ser. No. 86,514
Int. Cl.[6] G06F *9/00;15/16*
U.S. Cl. 395—27 **29 Claims**



1. A distance calculating neural network classifier integrated circuit chip comprising:

a. an input buffer for receiving and buffering an unknown input data vector with N elements at an input port of the input buffer, and an output port for sequentially outputting the vector elements;

b. a prototype memory array for storing a multiplicity of M prescribed prototype vectors, each prototype vector having N elements, and having M output ports for sequentially outputting the elements of each prototype vector in parallel;

c. a distance calculating unit having a multiplicity of parallel distance processing units, each processing unit having a first and a second input, the first input of each connected to the output port of the input buffer, the second input of each connected to a prescribed output port of the prototype memory array for sequentially calculating a distance metric representative of a vector distance between the unknown input data vector and each of the M prescribed prototype vectors, and the distance calculating unit having an output port for outputting the calculated distance metrics;

d. a prototype parameter memory for storing a prescribed set of M prototype vector distance classification parameters, one for each of the M prototype vectors, and an output port for reading out the stored classifications;

e. a mathematical processing unit having a first input port connected to the output port of the distance calculating unit, a second input port connected to the output port of the prototype parameter memory, for comparing the M calculated distance metrics with each of the M prototype vector distance classification parameters, and for producing a firing indicator associated with each of the M prototype vector distance classification parameters after each comparison that shows the distance metric to be less than the prototype vector distance classification parameter; and

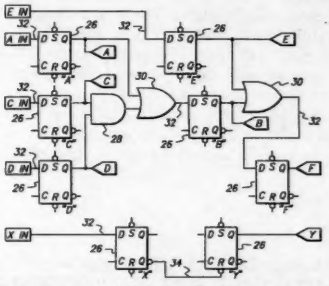
f. a microcontroller having a program memory for storing a prescribed classification program and having a control bus for distributing control signals throughout the chip, so that the classifier integrated circuit chip operates in accordance with the prescribed classification program.

5,487,134

REAL-TIME RULE BASED PROCESSING SYSTEM

Dan Ballard, San Diego, Calif., assignor to Reticular Systems, Inc., San Diego, Calif.

Continuation of Ser. No. 23,059, Feb. 25, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 393,241
Int. Cl.[6] G06F *15/18*
U.S. Cl. 395—51 **11 Claims**



1. An inference circuit which simultaneously forms a plurality of inferences from a plurality of input variables, said inference circuit comprising:

a set of logic gates representative of a rule network comprising a plurality of rule network portions, wherein each said portion comprises one or more of said logic gates connected together, wherein each said portion is capable of forming one of said inferences, and wherein each rule network portion simultaneously forms a one of said inferences;

a set of working memory storage elements representative of a working memory comprising a plurality of working memory groups, wherein each said group comprises one or more of said elements, each said element capable of storing one of said inferences;

a first set of signal lines connecting an output of each of the rule network portions to an input of a respective one of the working memory storage elements so that each inference is simultaneously stored in one of said working memory storage elements; and

a second set of signal lines connecting the output of each working memory storage element from a selected one of said

working memory groups to an input of a respective selected group of said rule network portions so that the inferences stored in said selected working memory group are available for subsequent inferences by the selected group of said rule network portions.

5,487,135

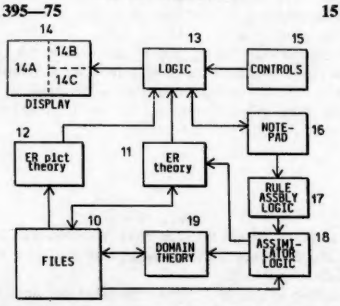
RULE ACQUISITION IN KNOWLEDGE BASED SYSTEMS

Paul R. W. Freeman, Southville Bristol, England, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 799,300, Nov. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 438,487, Feb. 12, 1990, abandoned. This application Aug. 12, 1994, Ser. No. 289,838

Int. Cl.[6] G06F *15/18*

U.S. Cl. 395—75 **15 Claims**



8. A method for constructing a new rule for a domain theory having an associated entity relationship (ER) theory represented by data which relates to the domain theory and which can be represented diagrammatically, wherein said domain theory includes one or more existing rules, comprising the steps of:

(a) displaying an ER diagram obtained from the ER theory;

(b) selecting elements of the ER diagram and related expressions for use in constructing a new rule;

(c) storing the selected elements and related expressions as stored conditions indicative of a new rule; and

(d) generating the new rule from at least the stored conditions.

5,487,136

METHOD AND CIRCUIT FOR PROCESSING DOT MATRIX IMAGE DATA IN A PAGE PRINTER

Ji-Ho Ro, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 29, 1992, Ser. No. 997,086

Claims priority, application Japan, Nov. 27, 1992, 1992-22635

Int. Cl.[6] B41J *2/51*

U.S. Cl. 395—108 **7 Claims**

1. A circuit for processing dot matrix image data for printing in a page printer, comprising:

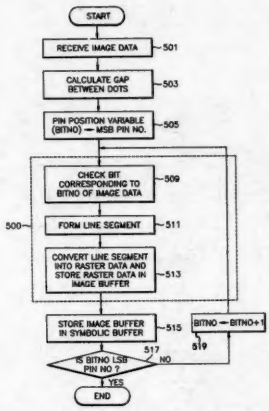
means for receiving the dot matrix image data from a host computer;

means for determining how many dots in said page printer correspond to one dot of the dot matrix image data received;

means for initializing a pin position variable, indicative of a location of a pin among a plurality of vertical pins of a dot matrix printer head, to a most significant bit pin number;

means for forming a line segment by checking a bit of the image data corresponding to the pin position variable;

means for checking whether the pin position variable corresponds to a least significant bit pin number;



means for increasing the pin position variable by one when said pin position variable does not correspond to the least significant bit pin number and returning to said step of forming a line segment; and

means for ending the processing of the dot matrix data when said pin position variable corresponds to the least significant bit pin number.

5,487,137

PRINT DATA PROCESSING APPARATUS

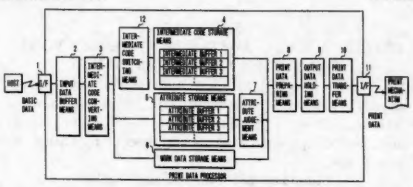
Masatoshi Matsuhira, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed May 25, 1993, Ser. No. 66,247

Claims priority, application Japan, Jun. 11, 1992, 4-152389

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—115 **6 Claims**



1. A print data processing apparatus coupled between a host computer and a print apparatus, said print data processing apparatus comprising:

input data holding means for holding basic data received through an interface from the host computer;

intermediate code converting means for preparing intermediate codes by converting the basic data held by said input data holding means;

intermediate code storage means having a plurality of intermediate buffers for dividing the intermediate codes into a plurality of intermediate code groups, and sequentially storing each of the intermediate code groups in an intermediate buffer;

an attribute storage means, having a plurality of attribute buffers, each attribute buffer storing modification data and position data in a sheet forwarding direction for each of the intermediate code groups stored in a corresponding intermediate buffer, the modification data and position data in a sheet forwarding direction being prepared using the basic data held by said input data holding means;

a single scanning line judgment means for selecting the intermediate buffers related to a single scanning line to be currently processed on the basis of the respective position data in the sheet forwarding direction stored in said attribute buffers in said attribute storage means; and

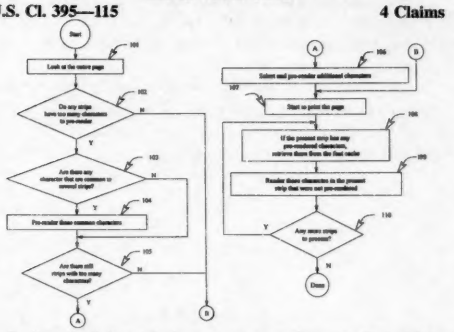
a print data preparing means for preparing print data from the intermediate code groups held by the intermediate buffers selected by said single scanning line judgment means and the respective modification data stored in the attribute buffers.

5,487,138

METHOD TO REDUCE MEMORY REQUIREMENTS IN ASIAN PRINTERS WHILE IMPROVING PERFORMANCE

Robert A. Rust, and Wayne A. Overby, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 2, 1993, Ser. No. 116,181
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—115 **4 Claims**



1. A method for reducing memory requirements in a printer means when printing a page of characters, said printer means capable of rendering a maximum number of characters per unit time, said method being performed by said printer means, said method comprising the steps of:

dividing said page into a plurality of strips;

scanning said plurality of strips for any strips that contain a number of characters that exceeds said maximum number;

for each strip that contains said number of characters that exceeds said maximum number, pre-rendering those characters that exceed said maximum number and storing said pre-rendered characters in a memory; and

rendering each character in a strip from said plurality of strips when said printer means is ready to print said strip, if any character in said strip was pre-rendered then retrieving said pre-rendered character from said memory.

5,487,139

METHOD AND SYSTEM FOR GENERATING A RASTER DISPLAY HAVING EXPANDABLE GRAPHIC REPRESENTATIONS

Charles H. M. Saylor, Manlius; Vincent N. Cavo, Utica; James A. Riccardi, Jr., Yorkville, and Alan T. Piszcz, New York Mills, all of N.Y., assignors to Niagara Mohawk Power Corporation, Syracuse, N.Y.

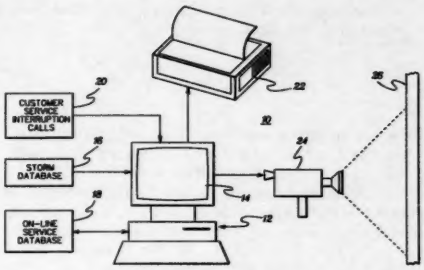
Filed Sep. 10, 1991, Ser. No. 758,875
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—135 **21 Claims**

1. A method for generating a raster display map having expandable graphic representations, said generating method employing an existing map and an object database containing information on addresses located within the territory represented by the existing map, said generating method comprising the steps of:

(a) obtaining and displaying a raster map corresponding to said existing map;

(b) providing a preexisting vector database having information characteristic to the territory represented by the raster map;

(c) displaying a vector map from said vector database, said displayed vector map containing said information characteristic to the territory depicted in said raster map;



(d) aligning corresponding areas of said raster map and said vector map;

(e) geocoding said object database information with X,Y coordinates relative to said vector database, at least some of said X,Y coordinates identifying addresses within the areas depicted by said aligned raster and vector maps; and

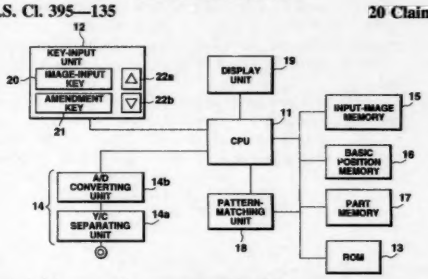
(f) displaying said raster map and a graphical representation of an address located within the area represented by the raster map, said graphical representation being expandable to provide object database information on said address.

5,487,140

DATA PROCESSING APPARATUS FOR OBTAINING PATTERN-IMAGE DATA

Masumi Toya, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1993, Ser. No. 156,852
Claims priority, application Japan, Dec. 21, 1992, 4-340299
Int. Cl.[6] G06F *15/72*
U.S. Cl. 395—135 **20 Claims**



1. A data processing apparatus comprising:

input means for inputting image data of a face of a person, the image data being obtained by taking a picture of the person;

image-data storing means for storing the image data input by said input means;

component-data storing means for previously storing a plurality of pattern data of each of components which compose a human face, said components of the human face including at least eyes, a nose and a mouth, and said plurality of pattern data representing different shapes of the component, respectively;

component-deriving means for deriving component-image data corresponding to one of the components from the image data stored in said image-data storing means;

judging means for determining a degree of resemblance of the pattern data of each of the components to the component-image data of the relevant component derived by said component-deriving means, and for detecting pattern data of a highest degree of resemblance with respect to all the components based on the determined degree of resemblance of the pattern data; and

processing means for combining the pattern data detected by said judging means to compose a portrait of the person,

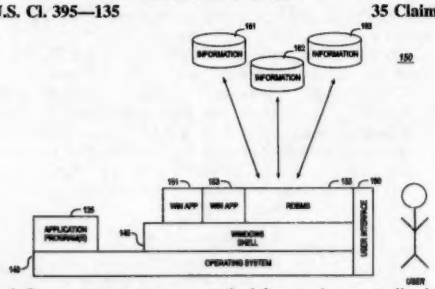
whereby a portrait is composed which shows a better resemblance to the face of the person.

5,487,141

DEVELOPMENT SYSTEM WITH METHODS FOR VISUAL INHERITANCE AND IMPROVED OBJECT REUSABILITY

Ronald A. Cain, Scotts Valley; Janet A. De Lu, Santa Cruz, and Ralph E. Lemke, Cupertino, all of Calif., assignors to Borland International, Inc., Scotts Valley, Calif.

Filed Jan. 21, 1994, Ser. No. 184,611
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—135 **35 Claims**



1. In a computer system, a method for creating an application program, the method comprising:

(a) providing a set of screen objects, each object having a set of properties and built-in methods for responding to user events, said set of objects including some objects which may be contained within other objects of the set;

(b) displaying a blank form for placement of objects;

(c) placing desired ones of said objects at desired locations on the form, each object having a visual boundary on screen;

(d) positioning first and second objects so that said first object is positioned inside the visual boundary of said second object; and

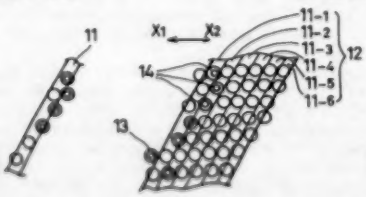
(e) in response to said positioning step, establishing an object hierarchy specifying a container relationship between said first and second objects, said container relationship specifying that user events occurring at said first object are passed to said built-in methods of said second object for processing after processing by said built-in methods of said first object.

5,487,142

ANTI-ALIASING LINE DISPLAY APPARATUS

Noriko Nakayama, and Hiroshi Nakayama, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 21, 1994, Ser. No. 184,153
Claims priority, application Japan, Mar. 19, 1993, 5-059918
Int. Cl.[6] G06F *15/16*
U.S. Cl. 395—143 **11 Claims**



1. An anti-aliasing line display apparatus comprising:

an input means for inputting a coordinate and an attribute of a straight line which is to be displayed;

judging means for judging a width and a slope of the input straight line;

analyzing means for decomposing the input straight line into individual pixels and setting a drawing pixel to be drawn;

distance calculating means for calculating a distance from a center of the drawing pixel set by the analyzing means to the input straight line;

occupying ratio calculating means for calculating an occupying ratio of the input straight line with respect to the drawing pixel based on the distance calculated by the distance calculating means and the width judged by said judging means;

frame buffer means input with a color in advance;

blending means for blending a color of the drawing pixel and the color input in the frame buffer means in advance based on the occupying ratio, and for writing the blended color in the frame buffer means; and

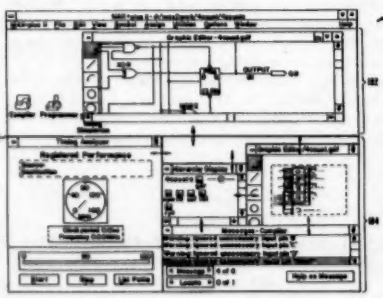
display means for displaying the input straight line based on the color of the drawing pixel written in the frame buffer means.

5,487,143

COMPUTER USER INTERFACE HAVING TILED AND OVERLAPPED WINDOW AREAS

Timothy J. Southgate, San Carlos, Calif., assignor to Altera Corporation, San Jose, Calif.

Filed Apr. 6, 1994, Ser. No. 223,930
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—157 **12 Claims**



12. An apparatus for displaying multiple windows on a display area, wherein the display area is a window corresponding to an application program being executed, the apparatus comprising:

a processor coupled to the display area for executing instructions that control the displaying of windows on the display area;

allocation means for allocating first and second window areas on the display area, wherein the first window area is an overlapped window area and the second window area is a tiled window area;

designation means for designating a window as overlapped or tiled;

display means for displaying two or more overlapped windows in the overlapped window area, wherein two or more windows overlap, and for displaying tiled windows in the tiled window area wherein the windows area displayed without overlapping.

5,487,144
SCHEDULING SYSTEM

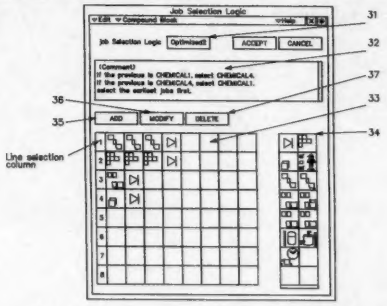
Kimikazu Takahashi; Haruko Mitake, and Shigeru Fujimura, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Sep. 20, 1993, Ser. No. 124,401

Claims priority, application Japan, Dec. 1, 1992, 4-321897; Dec. 7, 1992, 4-326521

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—161 **26 Claims**



1. A scheduling system for displaying, on a display field, a plurality of function blocks, each of which assigns a predetermined program operation, and for relocating the plurality of function blocks to realize a plurality of logics for scheduling, said scheduling system comprising

a logic formation interface for combining and relocating ones of said function blocks for assigning predetermined program operations, thereby assigning operational contents and operational order of a program and completing formed logics for scheduling;

a logic storage unit for storing the formed logics;

an execution unit for executing the scheduling by using the formed logics stored in said logic storage unit; and

wherein each of said plurality of function blocks comprises

means for performing evaluation on basis of element selection in a function block;

means for transferring a row of output elements from a first function block to an adjacent function block located in a first location when a row of input elements in said first function block is identical to the performed evaluation; and

means for transferring said row of input elements from said first function block to another adjacent function block located in a second location when said row of input elements in said first function block is not identical to the performed evaluation.

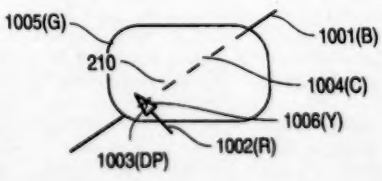
5,487,145
METHOD AND APPARATUS FOR COMPOSITING DISPLAY ITEMS WHICH MINIMIZES LOCKED DRAWING AREAS

Donald M. Marsh, Mountain View, and Jeff Zias, Santa Clara, both of Calif., assignors to Taligent, Inc., Cupertino, Calif.

Filed Jul. 9, 1993, Ser. No. 89,924

Int. Cl.[6] G06F *9/34*

U.S. Cl. 395—162 **15 Claims**



2. A method of generating a composite graphic image from a plurality of overlapping opaque and non-opaque graphic images, each of the plurality of graphic images being included in one of a plurality of groups, and within a group, the graphic image being displayed at a depth level which determines a visual distance of the graphic image from a viewer relative to other images of the group, each of the plurality of groups being associated with a group level indicative of a visual distance of the each group from the viewer relative to the other groups, the method comprising the steps of:

(a) selecting an active image from the plurality of graphic images and determining one of the plurality of groups in which the active image is located;

(b) determining whether the active image intersects graphic images located in the one group and having a higher depth level;

(c) determining whether graphic images in any of the plurality of groups having a higher group level than the one group intersect the active image; and

(d) combining the active image with all intersected non-opaque images to generate the composite graphical image including the step of locking a region of the active image defined by the smallest intersection of the active image and an intersecting image to minimize the amount of image data which is locked.

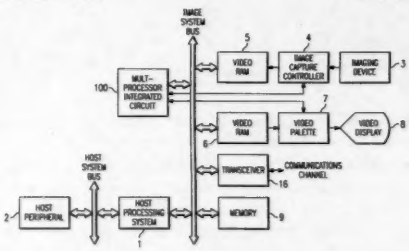
5,487,146
PLURAL MEMORY ACCESS ADDRESS GENERATION EMPLOYING GUIDE TABLE ENTRIES FORMING LINKED LIST

Karl M. Guttag, Sugarland; Sydney W. Poland, Katy, both of Tex.; Keith Balmer, Bedford, England; Robert J. Gove, Plano, and Christopher J. Read, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 8, 1994, Ser. No. 209,124

Int. Cl.[6] G06F *12/06*

U.S. Cl. 395—166 **18 Claims**



1. A data processing device comprising:

a memory storing data at a plurality of corresponding addresses;

a control circuit operative to receive a packet transfer request and packet transfer parameters, said packet transfer parameters including a start address, dimension values defining a block of addresses, a number of guide table entries and a table pointer;

a guide table including said number of guide table entries, each guide table entry including an address value, said table pointer initially pointing to a first guide table entry in said guide table; and

an address generating circuit coupled to said control circuit and to said guide table, said address generating circuit operative to receive said start address, said dimension values, said number of guide table entries and said table pointer from said packet transfer parameters, said address generating circuit forming a set of block of addresses for memory access corresponding said guide table entry by

forming a block start address from a predetermined combination of said start address and said address value of said guide table entry pointed to by said table pointer, a first block start address being said start address,

forming a block of addresses from said block start address and said dimension values,

performing a memory access at said block of addresses, and

updating said table pointer to point to a next entry in said guide table following said memory access if less memory accesses than said number of guide table entries have been performed.

5,487,147

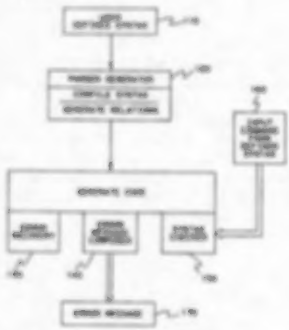
GENERATION OF ERROR MESSAGES AND ERROR RECOVERY FOR AN LL(1) PARSER

James P. Brinson, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 5, 1991, Ser. No. 755,270

Int. Cl.[6] **G06F** *13/00*

U.S. Cl. 395—180 **3 Claims**



1. A method for dynamically producing a set of synchronizing symbols, said method comprising the steps of:

creating a copy of a parsing stack, said parsing stack being produced by a parser operating consistently with a set of grammar rules to create said stack;

adding a bottom of stack indicator to the set of synchronizing symbols;

scanning said stack to determine if the symbol at the top of the stack is the bottom of stack indicator and terminate synchronizing symbol accumulation if it is, otherwise, continue processing by:

determining if the symbol at the top of the stack is a nonterminal symbol in said grammar and, if so, adding First set symbols associated with said top of stack symbol to said set of synchronizing symbols and replacing said nonterminal symbol on said stack in accordance with a designated grammar rule for it, and continuing processing at said scanning step, but if said top of stack symbol is not a nonterminal symbol, continue processing by:

determining if said top of stack symbol is a terminal symbol in said grammar and, if so, adding said terminal symbol to said set of synchronizing symbols and removing said terminal symbol from said stack and continuing processing at said scanning step, but if said top of stack symbol is neither a terminal symbol nor a nonterminal symbol, continue processing by:

removing said neither terminal nor nonterminal symbol from said stack and continue processing at said scan step.

5,487,148

METHOD AND APPARATUS FOR DETECTING FAULTS IN A COMPUTER NETWORK

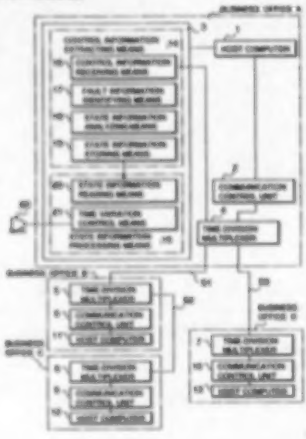
Naoki Komori, Tokyo; Akio Morita, Saitama, and Katsuaki Suzuki, Asaka, all of, Japan, assignors to Honda Giken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Feb. 9, 1994, Ser. No. 194,075

Claims priority, application Japan, Feb. 12, 1993, 5-024310

Int. Cl.[6] **G06F** *13/00*

U.S. Cl. 395—182.02 **4 Claims**



2. A central monitoring system for detecting faults in a computer network comprising a plurality of computer systems interconnected to the central monitoring system by a communication network, each computer system capable of detecting occurrences of (1) fault conditions affecting such computer system, and (2) fault restoration conditions affecting such computer system, and further capable of generating and transmitting over the communication network to the central monitoring system information (1) fault information in response to the occurrence of a detected fault condition and (2) fault restoration information in response to the occurrence of a detected fault restoration condition, the central monitoring system including:

(1) receiving means for receiving fault information from one of the computer systems by means of the communication network;

(2) storing means for storing a data record for received fault information, each data record corresponding to the transmitting computer system and indicating occurrence of a first level fault;

(3) receiving means for receiving fault restoration information from one of the computer systems by means of the communication network;

(4) comparison means for comparing received fault restoration information to a corresponding stored data record, and resetting such data record to indicate a no-fault condition;

(5) search means for repeatedly accessing each data record, and changing each data record indicating a first level fault to indicate occurrence of a second level fault if the data record has not been reset to indicate a no-fault condition before lapse of a first pre-set time period;

(6) indicator means for indicating an alarm condition corresponding to each data record set to the second level fault condition, the alarm condition indicating a serious fault condition.

5,487,149

COMMON CONTROL REDUNDANCY SWITCHI METHOD FOR SWITCHING A FAULTY ACTIVE COMMON CONTROL UNIT WITH AN INACTIVE SPARE COMMON CONTROL UNIT

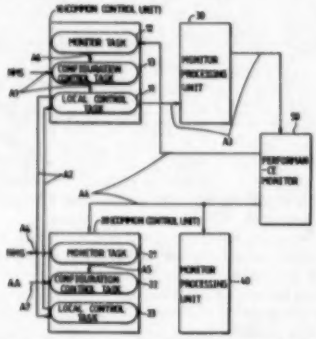
Ki Y. Sung, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Inc., Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 366,262

Claims priority, application Rep. of Korea, Dec. 29, 1993, 93-30521

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.08 6 Claims



1. A common control redundancy switch method carried out in a common control device including a pair of common control units each adapted to manage and control a network of a very small aperture terminal system, one of the common control units being normally at an active state and having a first local control task, a first monitor task and a first configuration control task, the other being normally at an inactive state and having a second local control task, a second monitor task and a second configuration control task, a pair of monitor processing units each adapted to exchange information with both a network management system and each corresponding one of the common control units in a dual-ported ram manner and thereby function as an interface of a monitoring processor bus, and a performance monitor adapted to function as a switch for connecting the currently active one of the common control units with the monitoring processor bus so as to achieve a common control redundancy switching operation, the common control redundancy switch method comprising the steps of:

(A1) receiving a switch message from the network management system via the first configuration control task by the first local control task;

(A2) receiving the switch message from the first local control task by the inactive common control unit and transmitting a response to the received switch message to the first local control task;

(A3) transmitting information about a major error to be corrected in the first local control task to the monitor processing unit corresponding to the active common control unit and thereby executing a switching operation in the performance monitor;

(A4) continuously reading interface parts of the performance monitor at half second intervals by the monitor tasks of the common control units, checking whether respective current states of the common control units have been switched, on the basis of the result of the reading, transmitting the switch result to the network management system when the state of the inactive common control unit has been checked to be switched to its active state;

(A5) informing the second configuration control task by the second monitor task of the switch result that the inactive common control unit has been switched to its active state;

(A6) informing the first configuration control task by the first monitor task of the switch result that the active common control unit has been switched to its inactive state; and

(A7) checking states of operations performed by the active common control unit for the network of the very small aperture terminal system, by the second configuration control task of the inactive common control unit switched to the active state and an updating data base of the second configuration control task with the checked operation states.

5,487,150

Patent Not Issued For This Number

5,487,151

TRANSMISSION ERROR DETECTION SYSTEM FOR USE IN A DISASTER PREVENTION MONITORING SYSTEM

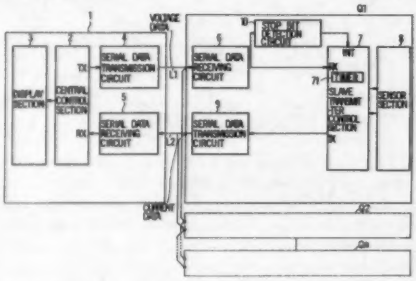
Masamichi Kikuchi, Ayase, and Akio Adachi, Machida, both of, Japan, assignors to Hochiki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 859,104, Mar. 27, 1992, abandoned. This application Dec. 14, 1994, Ser. No. 355,827

Claims priority, application Japan, Apr. 15, 1991, 3-082338; Apr. 15, 1991, 3-082340

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—185.02 3 Claims



1. A transmission error detection method in a disaster prevention monitoring system, for detecting errors in data transmission between a receiver and terminal units, comprising the steps of:

connecting a plurality of terminal units having specific address data to first and second transmission lines led out from a receiver;

sending out access data including said address in the form of a voltage from said receiver through said first transmission line;

sending back response data by a terminal unit specified in the access data in the form of an electric current through said second transmission line during a response time period;

said response data sent back by the terminal unit which has responded to the access data sent out by said receiver being formed of terminal state data and checksum data produced by adding the terminal state data to said specific address data;

said terminal units, whose address are in accordance with the address specified in the access data when said receiver carries out accessing by specifying the address of said terminal units, transfer said response data during said response time period, and the terminal units, whose address are not in accordance with the address specified in the access data, inhibit receiving the response data through said first transmission line during said response time period;

adding address data specified by the receiver at a time of accessing to the terminal state data sent back during said response time period by said receiver; and determining that a transmission error has occurred when said addition does not match said checksum data, a transmission error being checked for correctness by comparing checksum data with data formed by adding the terminal state data to said specific address data

at a receiver, and whether a response is present with state information transmitted from a specified address.

5,487,152

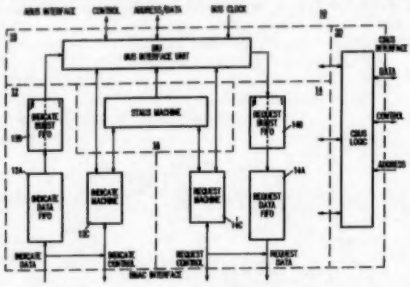
METHOD AND APPARATUS FOR FRAME HEADER SPLITTING IN A MEDIA ACCESS CONTROL/HOST SYSTEM INTERFACE UNIT

Desmond W. Young, Campbell, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 141,472, Oct. 22, 1993, abandoned, which is a division of Ser. No. 989,942, Dec. 10, 1992, abandoned, which is a continuation of Ser. No. 516,245, Apr. 27, 1990, abandoned. This application Sep. 19, 1994, Ser. No. 308,635

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.01 **3 Claims**



1. An interface system connected between a local area network communications medium and a network station for transferring information frames between the communications medium and a memory system associated with the network station, wherein each information frame consists of a sequence of frame segments having identifiable boundaries therebetween, and wherein the memory system includes a plurality of separate storage areas, the interface system comprising:

a bus interface unit connectable to the network station for transferring information frames between the interface system and the memory system;

indicate circuitry connected to the bus interface unit and connectable to the communications medium for transferring information frames received by the interface system from the communications medium to the memory system via the bus interface unit;

request circuitry connected to the bus interface unit and connectable to the communications medium for transferring information frames received by the interface system from the memory system via the bus interface unit to the communications medium;

frame segment detection circuitry connected to the indicate circuitry for identifying the identifiable boundary between first and second adjacent frame segments of an information frame prior to transfer of the information frame to the system memory via the bus interface unit; and

segment transfer control circuitry connected to the frame segment detection circuitry for providing a control signal to the bus interface unit such that the bus interface unit transfers the first of the adjacent frame segments to a first storage area of the memory system and the second of the adjacent frame segments to a second storage area of the memory system different from the first storage area.

5,487,153

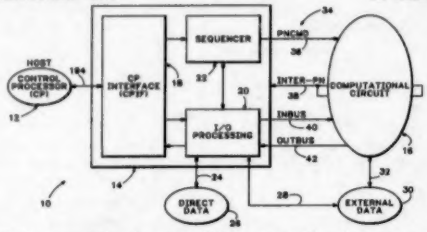
NEURAL NETWORK SEQUENCER AND INTERFACE APPARATUS

Daniel W. Hammerstrom, Aloha; Dean W. Mueller, and Stephen G. Owens, both of Portland, all of Oreg., assignors to Adaptive Solutions, Inc., Beaverton, Oreg.

Continuation of Ser. No. 752,769, Aug. 30, 1991, abandoned. This application Jun. 24, 1994, Ser. No. 267,005

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—250 **35 Claims**



1. A computational system (**10**) for use with a host processor (**12**) having a memory unit (**12***a*) therein, comprising:

at least one single-instruction multiple-data (SIMD) computational circuit component (**16**) having a first timing characteristic for processing inputs from an external device and for producing outputs thereto, wherein such inputs and outputs have a second timing characteristic that is different from said first timing characteristic;

at least one controller component (**14**) including transfer means (**22**) for effecting control instructions and bi-directional parallel data communications between said computational circuit component (**16**) and such external device.

5,487,154

HOST SELECTIVELY DETERMINES WHETHER A TASK SHOULD BE PERFORMED BY DIGITAL SIGNAL PROCESSOR OR DMA CONTROLLER ACCORDING TO PROCESSING TIME AND I/O DATA PERIOD

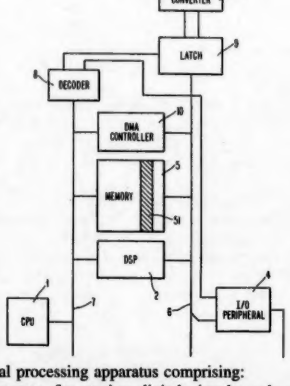
Keita Gunji, Tokyo, Japan, assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Jul. 14, 1992, Ser. No. 913,608

Claims priority, application Japan, Jul. 18, 1991, 3-204008

Int. Cl.[6] G06F *13/12;13/14*

U.S. Cl. 395—842 **5 Claims**



1. A signal processing apparatus comprising:

memory means for storing digital signals and processes for processing said digital signals;

input and output (I/O) means for inputting and outputting said digital signals to and from said signal processing apparatus;

a direct memory access (DMA) controller connected to said memory means and said I/O means for storing/reading said digital signals to/from said memory means and said I/O means in a direct memory access mode;

a digital signal processor (DSP) connected to said DMA controller, said I/O means, and said memory means for processing said digital signals stored in said memory means, said DSP executing a data empty check program under the control of a real-time monitor including a semaphore for checking for the existence of said digital signals to be processed and executing another process when said digital signals are not available for processing; and

a host CPU connected to said DMA and said DSP for determining whether a data transfer requested by a task of said processes is performed by said DMA controller or said DSP based upon a comparison between an I/O data period and a processing time of said task, whereby said data transfer requested by said task is performed by said DMA when said I/O period is shorter than said processing time of said task.

5,487,155

DATA SWITCH WITH MULTIPLEXERS FOR FORMING DATA CONNECTIONS AND CONTROL UNIT FOR CHECKING PERMISSIBILITY OF CONNECTIONS

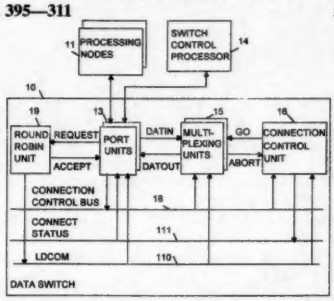
John R. Drewry, Stockport; Michael Collins, Withington, and Ashwani K. Korpal, Stockport, all of, England, assignors to International Computers Limited, London, England

Filed Sep. 30, 1994, Ser. No. 315,827

Claims priority, application United Kingdom, Nov. 23, 1993, 9324040

Int. Cl.[6] G06F *13/00;15/17*

U.S. Cl. 395—311 **3 Claims**



1. Data switching apparatus comprising:

(a) a plurality of input data channels and a plurality of output data channels;

(b) a command bus;

(c) means for sending a connection command on said command bus, said connection command specifying one of said input data channels as a source channel and specifying one of said output data channels as a destination channel for a proposed data connection;

(d) a plurality of multiplexing units connected to said input data channels, to said output data channels, and to said command bus, each of said multiplexing units comprising means for responding to said connection command, if said proposed connection is not already busy, by preparing said proposed data connection between said source channel and said destination channel, but without completing said connection; and

(e) a connection control unit connected to said command bus, said connection control unit comprising means for responding to said connection command by checking whether said proposed data connection is permissible and, if said proposed data connection is permissible, for sending a go-ahead signal to all of said multiplexing units;

(f) wherein each of said multiplexing units further includes means connected to receive said go-ahead signal from said connection control unit and for responding to said go-ahead signal by connecting said source channel to said destination channel, thereby completing said proposed data connection.

5,487,156

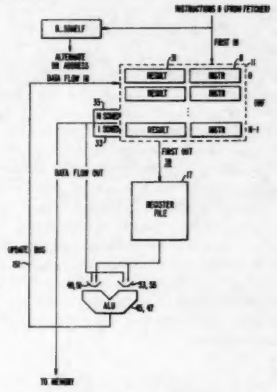
PROCESSOR ARCHITECTURE HAVING INDEPENDENTLY FETCHING ISSUING AND UPDATING OPERATIONS OF INSTRUCTIONS WHICH ARE SEQUENTIALLY ASSIGNED AND STORED IN ORDER FETCHED

Valeri Popescu, 12686 Monterey Cypress, San Diego, Calif. 92130; Merle A. Schultz, 1013 Fern St., Escondido, Calif. 92027; Gary A. Gibson, 2624 La Golandrina, Carlsbad, Calif. 92009; John E. Sprackler, 3540 Moultrie Ave., San Diego, Calif. 92117, and Bruce D. Lightner, 10305 Moselle St., San Diego, Calif. 92131

Continuation-in-part of Ser. No. 451,403, Dec. 15, 1989, abandoned. This application Dec. 5, 1990, Ser. No. 622,893

Int. Cl.[6] G06F *9/30*

U.S. Cl. 395—375 **36 Claims**



1. A data processing system for processing information in response to a series of instructions including instructions that control arithmetic operations on the information, the data processing system comprising:

register means for storing information;

fetching means for continuously fetching instructions from the series of instructions;

shelving means coupled to the fetching means to receive fetched instructions and to store multiple such instructions in the order fetched, wherein each instruction within said shelving means is identified by a sequential instruction identifier assigned in the order fetched;

scheduling means coupled to the shelving means for continuously selecting instructions in the shelving means for which all information required for execution is available in one of the register means or the shelving means and for issuing those instructions for execution in an order independent of the order in which those instructions were fetched;

arithmetic means coupled to the scheduling means for performing operations on information in one of the register means or the shelving means in response to instructions supplied from the shelving means to generate execution results, the arithmetic means further coupled to the shelving means so that the shelving means receives the results of execution of instructions and is capable of storing the result of the execution of every instruction stored within said shelving means; and

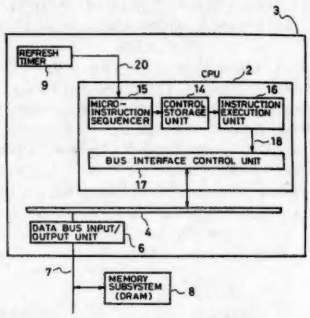
retirement means for copying results of the execution of the oldest instruction in the shelving means into the register means and removing that instruction from the shelving means.

5,487,157

MICROPROGRAMMED MICROCOMPUTER WITH HIGH-SPEED INTERRUPT FOR DRAM REFRESH

Shigeo Mizugaki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1994, Ser. No. 248,793
Claims priority, application Japan, Jun. 15, 1993, 5-143466
Int. Cl.[6] G06F *9/32*
U.S. Cl. 395—375 **10 Claims**



1. A microcomputer having a refresh function and comprising:

a CPU including a control storage unit for storing a set of microinstructions and control means for controlling the order of executing microinstructions by specifying addresses for storing the set of microinstructions, and

a timer for specifying a time interval of a refresh cycle for a dynamic memory, wherein a count termination signal of said timer is input into said control means;

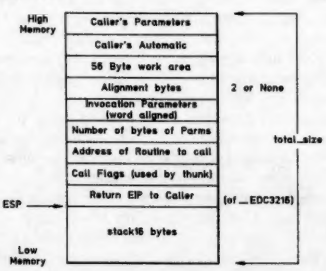
wherein said CPU receives the count termination signal of said timer applied to said control means therein, interrupts the execution of a set of microinstructions, executes another set of microinstructions for generating a refresh cycle, and resumes the execution of the set of microinstructions when the execution of the set of microinstructions for generating the refresh cycle is completed.

5,487,158

METHOD AND PROCEDURE CALL MECHANISM FOR CALLING 16-BIT FUNCTIONS FROM 32-BIT FUNCTIONS

Iam R. Amelina; David M. Mooney, both of Toronto, and Kevin A. Stoodley, Richmond Hill, all of, Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 43,454, Apr. 6, 1993, abandoned. This application Sep. 6, 1994, Ser. No. 301,280
Int. Cl.[6] G06F *9/40*
U.S. Cl. 395—375 **18 Claims**



1. In a computing environment, a method for calling a 16-bit code from a 32-bit subroutine, in which at least one stack frame in a memory stack is allocated to the 32-bit subroutine, comprising the computer implemented steps of:

defining a consecutive series of 64K byte boundaries in the stack;

providing means for accessing variables and data objects spanning any 64K byte boundary defined in the stack from below the 64K byte boundary;

building a parameter list in the stack in 16-bit form; and

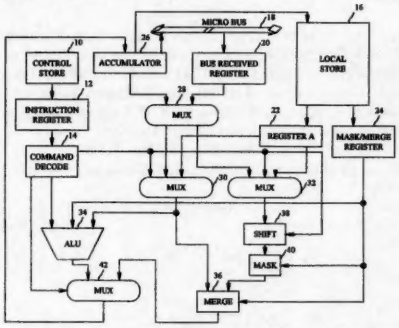
allocating stack space for data to be used by the 16-bit code.

5,487,159

SYSTEM FOR PROCESSING SHIFT, MASK, AND MERGE OPERATIONS IN ONE INSTRUCTION

Larry L. Byers, Apple Valley; Joseba M. De Subijana, Minneapolis, and Wayne A. Michaelson, Circle Pines, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 23, 1993, Ser. No. 172,526
Int. Cl.[6] G06F *9/305;9/315*
U.S. Cl. 395—375 **4 Claims**



1. A system for selectively executing shift, mask, and merge operations on two operands specified by one computer instruction according to a programmably selectable shift count, a programmably selectable shift direction, and programmably selectable mask and merge conditions, comprising:

a first register to hold at least temporarily a first operand to be manipulated;

a second register to hold at least temporarily a second operand to be manipulated;

selection circuitry, coupled to said first and said second registers, for alternatively selecting true of said first and said second registers for shifting and masking, and then merging with the other register, based on the contents of the computer instruction;

shift circuitry, connected to said selection circuitry and said first and said second registers, for selectively shifting said selected one of said first and said second registers according to the programmably selectable shift count and shift direction;

a mask/merge register holding mask and merge indicators representing the programmably selectable mask and merge conditions, said mask indicators indicating a plurality of single-bit flags controlling masking of multiple-bit portions of a mask operand, said merge indicators including a plurality of single-bit flags controlling merging of multiple-bit portions of merge operands;

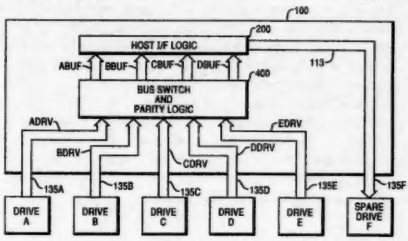
mark circuitry, connected to said shift circuitry and said mask/merge register, for selecting a portion of said shifted selected one of said first and said second registers to be merged, by masking said shifted selected one of said first and said second registers according to said mask indicators; and

merge circuitry, connected to said mask circuitry and said mask/merge register, for merging said selected portion of said shifted selected one of said first and said second registers with the other register, according to said merge indicators, to produce a merged result.

5,487,160
CONCURRENT IMAGE BACKUP FOR DISK STORAGE SYSTEM

Edward D. Bemis, Derby, Kans., assignor to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, Milpitas, Calif., and Symbios Logic Inc., Fort Collins, Colo.

Filed Dec. 4, 1992, Ser. No. 985,710
Int. Cl.[6] G06F *12/00*
U.S. Cl. 395—441 **9 Claims**



1. In a disk storage system, a method for concurrently backing up contents of said disk storage system to a backup storage device and processing a write I/O request received by said disk storage system, comprising the steps of:

sequentially copying data from said disk storage system to said backup storage device;

halting said process of sequentially copying data from said disk storage system to said backup storage device upon receipt of said write I/O request;

determining whether said write I/O request updates data residing in a storage area within said disk storage system which has not been copied to said backup device;

copying the data residing in said storage area to a temporary storage device if the data residing in said storage area has not been copied to said backup device;

executing said write I/O request to update the data residing in said storage area;

resuming said process of sequentially copying data from said disk storage system to said backup storage device; and

copying the contents of said temporary storage device to said backup storage device upon completion of said process of sequentially copying data from said disk storage system to said backup storage device.

5,487,161
COMPUTERIZED DATA TERMINAL WITH SWITCHABLE MEMORY ADDRESS FOR START-UP AND SYSTEM CONTROL INSTRUCTIONS

Steven E. Koenck, Cedar Rapids; Rickey G. Austin, Lisbon, and Darrell L. Boatwright, Cedar Rapids, all of Iowa, assignors to Norand Corp., Cedar Rapids, Iowa

Filed Nov. 25, 1992, Ser. No. 982,303
Int. Cl.[6] G06F *12/02*
U.S. Cl. 395—442 **18 Claims**

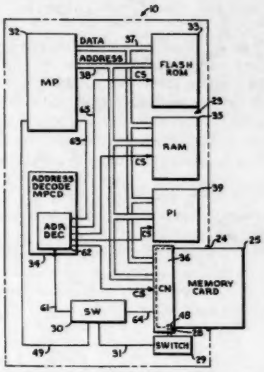
1. Microprocessor controlled apparatus comprising:

a microprocessor device and a microprocessor operating circuit, the microprocessor device communicatively coupled into the microprocessor operating circuit;

reprogrammable memory coupled into the microprocessor operating circuit to communicatively interact with the microprocessor device, the reprogrammable memory containing a plurality of addressable memory locations;

means for addressing designated ones of the memory locations of the reprogrammable memory for start-up operations of the microprocessor;

means for selectively coupling additional memory locations into the microprocessor operating circuit to communicatively interact with the microprocessor device;



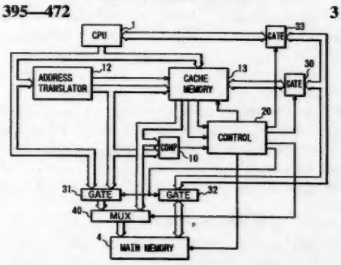
means for substituting designated ones of the additional memory locations for the designated ones of the reprogrammable memory to be addressed by the addressing means for start-up operations of the microprocessor; and

means for reversing the addresses of the designated ones of the memory locations of the reprogrammable memory having start-up operations of the microprocessor and the addresses of the additional memory locations having the start-up operations of the microprocessor.

5,487,162
CACHE LOCK INFORMATION FEEDING SYSTEM USING AN ADDRESS TRANSLATOR

Tetsuya Tanaka, Osaka, and Takashi Taniguchi, Moriguchi, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 841,106, Feb. 25, 1992, abandoned. This application Nov. 10, 1994, Ser. No. 338,818
Int. Cl.[6] G06F *12/08*
U.S. Cl. 395—472 **3 Claims**



2. An apparatus for cache lock control, comprising:

a cache memory having a plurality of data entries, each of said plurality of data entries being divided into a plurality of segments including: at least one data segment for storing data, at least one address segment for storing an address, and at least one cache lock segment for storing cache lock information;

means for controlling updating of said at least one data segment and said at least one address segment in any of the data entries of the cache memory in response to cache lock information in corresponding cache lock segments in said any of the data entries such that data segments and address segments of each of said plurality of data entries are selectively preventable from being overwritten by setting a corresponding cache lock segment therein;

an address translator having a plurality of address entries, each of said plurality of address entries divided into a plurality of segments including at least one cache locking segment storing cache lock information;

means for selecting one of the data entries of said cache memory;

means for updating a data segment and an address segment in a selected data entry of said cache memory; and

means for transferring cache lock information to a cache lock segment of the selected data entry of said cache memory from a cache locking segment in a corresponding address entry of said address translator when a data segment and an address segment in the selected data entry of said cache memory are updated;

wherein said means for controlling includes:

a control register for storing information represented by a cache lock control bit, and

means for selectively executing and inhibiting said updating of a data segment and an address segment in said any of the data entries of said cache memory in response to the information stored in the control register.

5,487,163

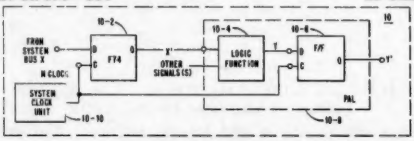
FAST SYNCHRONIZATION OF ASYNCHRONOUS SIGNALS WITH A SYNCHRONOUS SYSTEM

James W. Keeley, Nashua, N.H., assignor to Bull HN Information Systems Inc., Billerica, Mass.

Continuation of Ser. No. 593,438, Oct. 5, 1990, abandoned. This application Nov. 4, 1993, Ser. No. 148,030

Int. Cl.[6] H03K *5/13;5/135;19/003*

U.S. Cl. 395—550 **12 Claims**



1. A method of synchronizing an asynchronous bilevel input signal with the operations of a synchronously operated unit which is resilient to metastability wherein operations of said unit are timed by clocking signals which have leading and trailing edges and a predetermined clock time period between successive clocking signals and said successive clocking signals being generated by a timing unit within said unit, said method including the steps performed within said synchronously operated unit of:

(a) establishing a clock frequency having said predetermined clock time period:

(b) storing the state of said asynchronous bilevel input signal directly applied to a data input terminal of a first clocked bistable device having a clock input terminal directly connected to receive said clocking signals from said timing unit in response to said leading edge of a first one of said clocking signals;

(c) selecting said first clocked bistable device to have a metastable time delay period which is less than a predetermined maximum delay period;

(d) selecting a programmable logic circuit which has a logic time delay and setup delay period whose sum is no greater than said predetermined clock time period minus said metastable time period;

(e) directly applying a metastable output signal representative of said state generated by said first clocked bistable device at an output terminal of said first clocked bistable device as a result of having stored said asynchronous input signal in response to said leading edge of said first one of said clocking signals which occurs in close proximity to the time occurrence of a transition in level in said asynchronous bilevel input signal, to one input of said programmable logic circuit element having a plurality of input terminals and at least one output terminal, said programmable logic circuit element having an asynchronously operated logic section selected as having a predetermined minimum time delay period for providing an output result signal in response to an input signal generated within said unit and a synchronously operated register section having a number of synchronously operated clocked bistable devices;

(f) applying at least one input logic signal to another one of said plurality of input terminals of said programmable logic circuit element for generating said output result signal by performing a programmed one of a predetermined set of logical operations on said metastable output signal and said one input logic signal; and,

(g) programming said programmable logic circuit element for directly applying said output result signal as an input to one of said number of said synchronously operated clocked bistable devices directly connected to said timing unit to receive said clocking signals for storing said result signal in response to said leading edge of the clocking signal following said first one of said clocking signals so as to provide a stable output signal at said output terminal after said setup time delay period of said one clocked bistable device within said predetermined clock time period which corresponds to the sum of said metastable time delay period, said logic time delay period and said setup time delay period so as to produce a valid stable output at said output terminal synchronized with said timing unit within a maximum of two clock periods notwithstanding occurrences of said metastability.

5,487,164

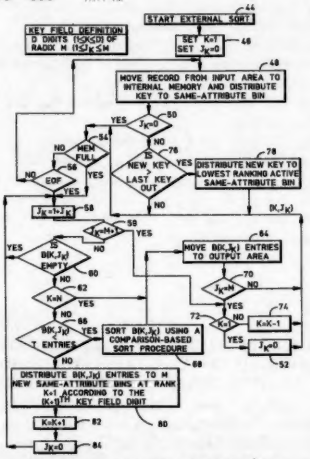
DISTRIBUTION-BASED REPLACEMENT SELECTION SORTING SYSTEM

Richard Kirchhofer, Fremont, and Bruce A. Wagar, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 14, 1993, Ser. No. 121,328

Int. Cl.[6] G06F *7/36*

U.S. Cl. 395—600 **8 Claims**



1. A computer-implemented method for distributively sorting a first plurality of data records according to their key fields, each said key field having a plurality N of digits of radix M, wherein said first plurality of data records are initially stored in unsorted order in an input storage area and are moved in intermediate or final sorted order to an output storage area, wherein N and M are positive integers, said method comprising the unordered steps of:

(a) moving a second plurality R of said data records from said input storage area into an internal memory means:

(b) assigning each of said second plurality R of said data records to a J^{th} same attribute bin, where J is the value of the most significant key field digit of said each data record:

(c) recursively distributing the record entries of each of said same-attribute bins, each recursion including the ordered steps of

(c.1) if said each same-attribute bin has no said record entries or one said record entry only or a plurality of identical said

record entries only, then removing all said each bin record entries to said output storage area, otherwise

(c.2) comparing each said record entry of said each same-attribute bin against an extrinsic attribute and assigning said each record entry to one of a plurality M of same-attribute subgroups and

(d) until said input storage area is empty, replacing in said internal memory means some or all of said sorted record entries removed into said output storage area, each replacement including the ordered steps of:

(d.1) moving one or more of said first plurality of data records from said input storage area to said internal memory means, and

(d.2) assigning each said new data record to the J^{th} said same-attribute bin, where J is the value of the most significant key field digit of said each new data record, and

(d.3) if the key field value of said each new data record meets or exceeds the key field value of said sorted record entry most recently removed to said output storage area, assigning said each new data record to said same-attribute subgroup most closely matching said each new data record extrinsic attribute, otherwise holding said each new data record for assignment during a subsequent said recursion.

5,487,165

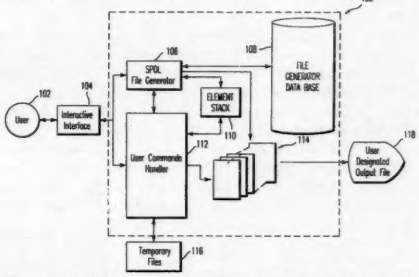
STANDARD PAGE DESCRIPTION LANGUAGE CLEARTEXT STRUCTURE GENERATOR

Donny Tsay, and Tetsuro Motoyama, both of San Jose, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan, and Ricoh Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 931,808, Aug. 11, 1992, Pat. No. 5,416,896, which is a continuation-in-part of Ser. No. 876,601, Apr. 30, 1992, Pat. No. 5,319,748, and a continuation-in-part of Ser. No. 876,251, Apr. 30, 1992, Pat. No. 5,325,484. This application Nov. 4, 1993, Ser. No. 147,603

Int. Cl.[6] G06F *17/22*

U.S. Cl. 395—600 **30 Claims**



27. A method for generating a file, comprising the steps of:

displaying a first plurality of elements for a user to select;

inputting a first selection of a desired element, the first selection corresponding to a first predetermined position in a hierarchy of elements which can appear in said file;

adding a line, to said-file, which corresponds to the first inputted selection;

pushing an entry onto a stack which corresponds to the first inputted selection at a first predetermined hierarchical level;

popping off the entry on the stack which corresponds to the first inputted selection and adding a line to said file which indicates an end of the first inputted selection when the first predetermined hierarchical level ends;

determining a second plurality of elements for the user to select using the first inputted selection and said hierarchy of elements;

displaying the second plurality of elements for the user to select;

inputting a second selection of a second desired element, the second selection corresponding to an element which is below the element of the first selection in said hierarchy of elements;

adding a line, to said file, which corresponds to the second inputted selection at a second predetermined hierarchical level;

pushing an entry onto the stack which corresponds to the second inputted selection;

popping off the entry on the stack which corresponds to the second inputted selection and adding a line to said file which indicates an end of the second inputted selection when the second predetermined hierarchical level ends.

5,487,166

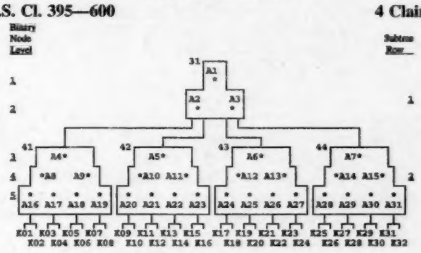
COMPUTER WITH TWO-DIMENSIONAL MERGE TOURNAMENT SORT USING OFFSET-VALUE CODING

David Cossock, Berkeley, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Sep. 19, 1994, Ser. No. 308,751

Int. Cl.[6] G06F *7/24*

U.S. Cl. 395—600 **4 Claims**



1. A computer system, comprising:

storage means for storing a list of records $R_1, \ldots, R_N$ to be sorted where each record is associated with a corresponding one of the keys $K_1, \ldots, K_N$, respectively, for ordering the records,

processing means for processing said records and keys and for controlling said storage means, said processing means including,

means for forming a two-dimensional tree having a tree structure in said storage means where said tree structure is formed of nodes including a single root node and a plurality of leaf nodes where each node except the root node is a child of exactly one parent node and wherein,

said nodes form a logical tree having a binary tree structure where each node is a parent node of at most two child nodes,

said two-dimensional tree is organized into a tree structure of a plurality of subtrees, where each subtree is formed by a plurality of said nodes organized in a binary tree structure, and where for each particular node in a particular subtree that is the root node in the particular subtree, then said particular node has a parent node that is a leaf node in another subtree whereby said another subtree is the parent subtree of the particular subtree,

code means for storing codes representing keys into said nodes,

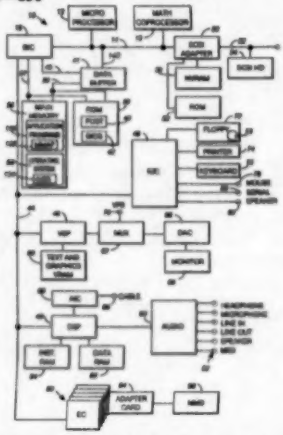
sort means for performing a tree sort of said keys using said codes by accessing subtrees.

5,487,167

PERSONAL COMPUTER WITH GENERALIZED DATA STREAMING APPARATUS FOR MULTIMEDIA DEVICES

Chris A. Dinallo; Michael J. Koval; William W. Lawton, all of Boca Raton; Martin J. Paulat, Jr., Delray Beach; John G. Tyler, Boynton Beach; Scott L. Winters, Plantation, and Gary G. Allran, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 816,517, Dec. 31, 1991, abandoned.
This application Aug. 9, 1994, Ser. No. 288,650
Int. Cl.[6] G06F *13/00;17/00*
U.S. Cl. 395—650 7 Claims



1. A multimedia data processing system comprising;

a processor;

a memory for storing at least one multimedia application program and a multitasking operating system, for execution by said processor, said memory having a plurality of buffers therein;

a source device operable as an origin for media data;

a target device operable as a destination for receiving said data from said source device; and

data streaming apparatus operable under said operating system for streaming data from said source device to said target device, said apparatus comprising:

first means operative, in response to execution of a stream create instruction in said application program, to create a source thread for streaming data from said source device into said buffers and a target thread for streaming data from said buffers to said target device said threads being dispatchable units of execution that are selectively executable under said multitasking operating system;

second means operative, in response to a start instruction in said application program, to first execute said source thread and fill said buffers with data from said source device, to then execute said target thread and read data from said buffers into said target device, and to thereafter alternately execute both threads to alternately fill and read data from said buffers, until reaching an end of data from said source device;

wherein said first and second means comprise a plurality of stream handlers, one of said stream handlers being a source handler operative to control data flow from said source device to said buffers and another one of said stream handlers being a target stream handler operative to control data flow from said buffers to said target device; and

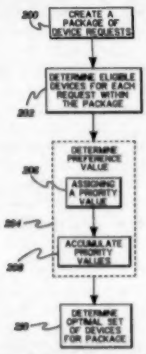
a stream manager operative to interact with said stream handlers and control operation thereof by sending stream helper commands (SHCs) to said handlers and by providing stream manager helper (SMH) services to said handlers in response to receiving SMH calls from said handlers.

5,487,168

METHOD AND SYSTEM FOR GLOBAL OPTIMIZATION OF DEVICE ALLOCATION

Robert V. Geiner, Poughkeepsie, and David L. Jensen, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 898,619, Jun. 15, 1992, abandoned.
This application Dec. 20, 1994, Ser. No. 359,943
Int. Cl.[6] G06F *13/18*
U.S. Cl. 395—650 26 Claims



1. An automated, computer implemented method for allocating devices in order to satisfy requests for said devices, said method comprising the steps of:

creating a package of device requests, said package of device requests being stored in an electronic memory means of said computer;

determining for each of said device requests in said package one or more eligible devices capable of satisfying the device request;

determining a sequence of priority values associated with each eligible device of each device request, wherein priority values within said sequence of priority values are assigned to different positions;

assigning to each of said device requests an eligible device selected from said one or more eligible devices capable of satisfying said device request such that a different eligible device is assigned to each device request;

adding priority values at each common position for each selected device thereby obtaining a sequence of summed priority values, wherein said sequence of summed priority values satisfies a specific optimizing function; and

allocating, to each device request, said eligible device, said eligible device being used by said computer after said allocating.

5,487,169

METHOD FOR TRANSLATING A TEST PLAN SOURCE FILE CONTAINING MULTIPLE PROGRAMMING LANGUAGES

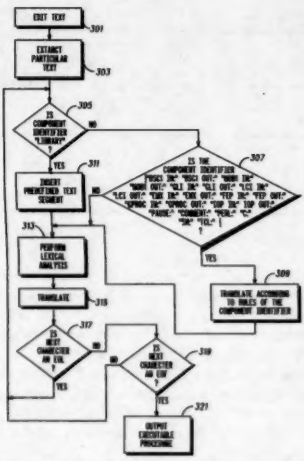
Lawrence E. Vraney, Cary; Michael S. Protofanousis, Glenview, both of Ill.; Dean R. Loew, Racine, Wis., and Robert W. van Daal, Glenview, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 18, 1993, Ser. No. 154,245
Int. Cl.[6] G06F *9/44*
U.S. Cl. 395—700 8 Claims

1. A method for translating a test plan source file containing multiple programming languages, each programming language being identified by a component identifier comprising the steps of:

(a) inputting the test plan source file to a translator;

(b) performing lexical analysis on the test plan source file to locate one of a plurality of component identifiers within the test plan source file, each component identifier having associated therewith a portion of text;



(c) translating the portion of text of the test plan source file associated with the one component identifier according to a translation rule associated with the one component identifier and copying the translated portion of text into a translated test plan file;

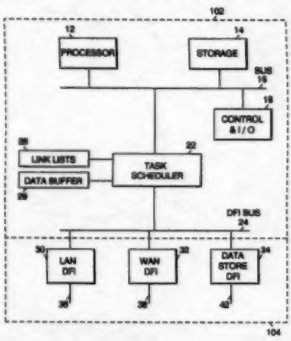
(d) repeating step (c) for each component identifier of the plurality of component identifiers.

5,487,170

DATA PROCESSING SYSTEM HAVING DYNAMIC PRIORITY TASK SCHEDULING CAPABILITIES

Brian M. Bass; Edward H. Ku; Bou-Chung Lin, and Simin H. Sanaye, all of Wake, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1993, Ser. No. 168,616
Int. Cl.[6] G06F *13/16;9/46*
U.S. Cl. 395—732 **10 Claims**



1. A data processing system having dynamic priority task scheduling capabilities, comprising:

a processor for processing tasks;

a memory, for storing control information and data, associated with said processor;

a system bus for communicating control information and data between said processor and said memory;

a bus controller connected to said processor and to said memory by the system bus and connected to a data bus, said bus controller controls data flow between said processor and said memory, said bus controller includes an integrated plurality of access granting means for dynamically scheduling task requests based on priority level grouping of tasks, time dependent isochronous access of task groups, and round-robin access of tasks within each of the grouping of tasks;

a data bus for communicating data from said processor or said memory to one or more interface units; and

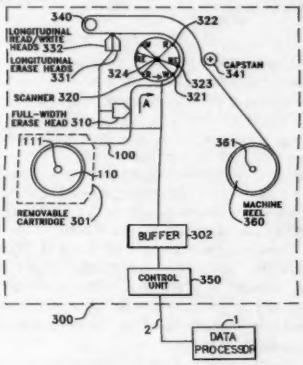
said one or more data interface units for communicating control and data signals between said data bus and a plurality of devices requesting access to said processor or said memory.

5,487,171

SYSTEM FOR READING AND STOPPING READING DATA FROM MAGNETIC TAPE INTO MEMORY IN RESPONSE TO MOUNT COMMAND AND WRITE COMMAND RESPECTIVELY FROM THE SYSTEM PROCESSOR

William C. Dodt, Broomfield; Terry R. Gottehrer, Louisville, and Charles A. Milligan, Golden, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 18, 1992, Ser. No. 947,204
Int. Cl.[6] G06F *15/02*
U.S. Cl. 395—840 **18 Claims**



1. In a magnetic tape drive reads and writes a stream of data records, received from e data processor, on a mountable magnetic tape, apparatus operationally independent of said data processor for prestalling data records written on said mountable magnetic tape media for said dam processor, comprising:

memory means for storing data records being transmitted between said data processor and said mountable magnetic tape;

means, responsive to a mountable magnetic tape requested by said data processor being mounted in said tape drive element, for transmitting control signals to said data processor indicative of the availability of said mountable magnetic tape on said tape drive;

means for reading data records from said mountable magnetic tape into said memory means concomitantly with said control signals being transmitted to said data processor;

means, responsive to the receipt of a read magnetic tape command from said data processor, for transmitting said read data records from said memory means to said data processor;

means, responsive to a mountable magnetic tape requested by said data processor being mounted in said tape drive and receipt of a write mountable magnetic tape command from said data processor, for disabling said reading means;

means for storing data records received from said data processor in said memory means; and

means, responsive to said mountable magnetic tape reaching magnetic tape write speed and position, for writing data records received from said data processor and stored in said memory means on to said mountable magnetic tape.

5,487,172

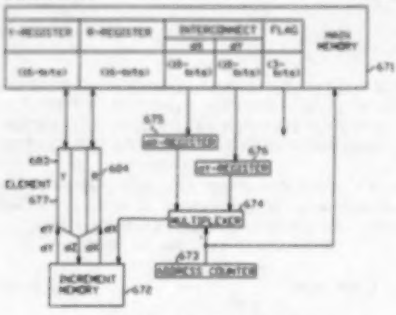
TRANSFORM PROCESSOR SYSTEM HAVING REDUCED PROCESSING BANDWITH

Gilbert P. Hyatt, P.O. Box 81230, Las Vegas, Nev. 89180

Continuation of Ser. No. 504,691, Jun. 15, 1983, which is a continuation of Ser. No. 754,660, Dec. 27, 1976, Pat. No. 4,486,850. This application Sep. 20, 1991, Ser. No. 763,461

Int. Cl.[5] G06F *17/14*

U.S. Cl. 395—800 **72 Claims**



SERIAL COMPUTATION INCREMENTAL PROCESSOR

1. A transform processor system comprising:

an input circuit generating a driving function signal;

a memory storing a plurality of input points, each input point having a plurality of parameters;

a coefficient processor generating transform coefficients in response to the driving function signal;

a first transform processor coupled to the coefficient processor and to the memory and generating a first transformed point in response to a first one of the plurality of input points stored by the memory and in response to the transform coefficients;

a second transform processor coupled to the coefficient processor and to the memory and generating a second transformed point in response to a second one of the plurality of input points stored by the memory and in response to the same transform coefficients as used for the generation of the first transform point; and

an output circuit coupled to the first transform processor and to the second transform processor and generating transformed output signals in response to the first transformed point and the second transformed point.

5,487,173

DTMF DETECTION IN AN INTEGRATED DATA PROCESSING SYSTEM

Israel Greiss, Raanana; Ronny Cohen, Ramat-Hasharon, and Omri Viner, Hod Hasharon, all of, Israel, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 75,273, Jun. 10, 1993, abandoned, which is a division of Ser. No. 806,082, Dec. 6, 1991, abandoned. This application Sep. 6, 1994, Ser. No. 301,737

Int. Cl.[6] G06F *17/10*

U.S. Cl. 395—800 **1 Claim**

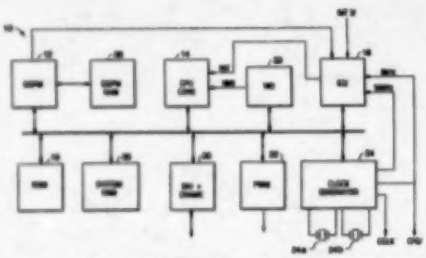
1. An integrated circuit data processing system comprising:

an internal bus for transferring both data and instructions;

a bus interface unit connected to the internal bus and adapted for connection via an external bus to an external memory array such that instructions and data stored in the external memory array may be transferred to the internal bus via the bus interface unit;

a general purpose (GP) central processing unit (CPU) connected to the internal bus for retrieving GP instructions, the GP CPU including means for executing GP instructions to process data retrieved by the GP CPU from the internal bus;

a digital signal processor (DSP) module connected to the internal bus, the DSP module including means for executing DSP



command-list code instructions to process an externally-provided signal received by the DSP module, execution of the DSP command-list code instructions by the DSP module being independent of and in parallel with execution of GP instructions by the GP CPU; and wherein

the DSP module executes a dual tone multi-frequency (DTMF) detection algorithm by executing a single command-list code instruction VCPOLY) that computes ACCEPT frequency detectors, REJECT frequency detectors and total signal energy; and wherein

the GP CPU includes decision logic that identifies a DTMF signal based on the ACCEPT frequency detectors, REJECT frequency detectors and total signal energy computed by the DSP module.

5,487,174

METHODS IN A CELLULAR MOBILE RADIO COMMUNICATION SYSTEM

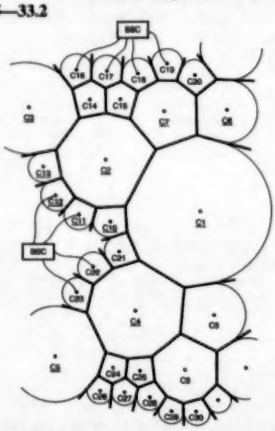
Bengt Y. Persson, Djursholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 23, 1993, Ser. No. 35,797

Claims priority, application Sweden, Mar. 24, 1992, 9200915

Int. Cl.[6] H04Q *7/22*

U.S. Cl. 455—33.2 **15 Claims**



1. A method of bidirectional communication in a cellular mobile telecommunication system having cells of substantially different size and a base station for each cell, comprising the steps of:

assigning a first base station of a first larger cell for a downlink of a bidirectional connection involving a mobile station and a second base station of a second cell smaller than the first cell for an uplink of the bidirectional connection;

transmitting from the mobile station radio signals pertaining to the connection;

measuring the strength of radio signals from the mobile station received by the first and second base stations;

comparing the measured strength of signals from the mobile station with each other and at least one desired value;

transmitting power control messages from the first base station to the mobile station in response to the result of the comparison;

monitoring the downlink and the uplink of the connection; and

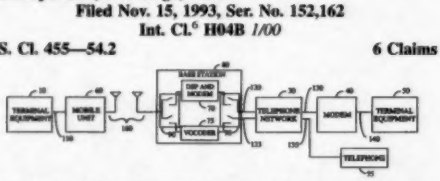
when downlink handoff from the first cell to the second cell is desirable, performing handoff of the downlink of the connection from the first cell independently of handoff of the uplink of the connection.

5,487,175

METHOD OF INVOKING AND CANCELING VOICE OR DATA SERVICE FROM A MOBILE UNIT

Gwain Bayley; Matthew S. Grob, both of San Diego; Gadi Karmi, Del Mar; Robert H. Kimball, and David S. Propach, both of San Diego, all of Calif., assignors to Qualcomm Incorporated, San Diego, Calif.

Filed Nov. 15, 1993, Ser. No. 152,162
Int. Cl.[6] H04B *1/00*
U.S. Cl. 455—54.2 **6 Claims**



1. A method of invoking and canceling data or voice service in a communication system comprised of a mobile unit having a data port for receiving and providing a terminal element signal, a voice port and vocoder for receiving and providing encoded voice signals, a wireless port for receiving and providing data signals and said encoded voice signals over a wireless link, and a keypad port for receiving and providing a manual user signal, said system further comprising a base station having a vocoder for receiving and providing said encoded voice signals, a modem for receiving and providing said data signals, and a wireless link port for receiving and providing said data signals and said encoded voice signals over said wireless link, wherein said communication system supports the simultaneous transfer of said encoded voice signals between said voice port and vocoder of said mobile unit and said vocoder of said base station on a voice connection and said data signals between said data port of said mobile unit and said modem of said base station on a data connection, wherein initially said communication system is in an initial state wherein said voice connection and said data connection are in an idle state, comprising the steps of:

receiving at said mobile unit when said communication system is in said initial state a first message on said terminal equipment signal wherein in said initial state said communication system is in a command mode such that said mobile unit interprets and acts upon said first message;

entering by said communication system a second state in response to said first message and establishing said voice connection over said wireless link wherein in said second state said communication system is in said command mode, said data connection is in said idle state, and said voice connection is in an active state;

receiving at said mobile station when said communication system is in said second state a second message on said manual user signal;

entering by said communication system a third state in response to said second message and establishing said data connection wherein in said third state said communication system is in said command mode, said data connection is in an active state, and said voice connection is in said active state;

receiving at said mobile station when said communication system is in said third state a third message on said terminal equipment signal;

entering by said communication system a fourth state in response to said third message and changing said communication system mode to a data mode wherein in said fourth state said communication system is in said data mode, said data connection and said voice connection are in said active state and wherein when said communication system is in said data mode said mobile unit passes said terminal equipment signal over said data connection as said data signals;

receiving at said mobile station when said communication system is in said fourth state a fourth message on said manual user signal;

entering by said communication system a fifth state in response to said fourth message and disconnecting said voice connection wherein in said fifth state said communication system is in said data mode, said data connection is in said active state and said voice connection is in said idle state;

receiving at said mobile station when said communication system is in said fifth state an escape sequence on said terminal equipment signal;

entering by said communication system a sixth state in response to said escape sequence and changing said communication system mode to said command mode wherein in said sixth state said communication system is in said command mode, said data connection is in said active state and said voice connection is in said idle state;

receiving at said mobile station when said communication system is in said sixth state a fifth message on said manual user signal; and

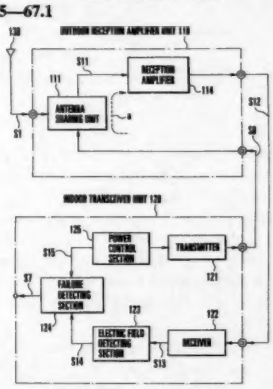
entering by said communication system said initial state in response to said fifth message and disconnecting said data connection.

5,487,176

RECEPTION AMPLIFIER FAILURE DETECTION DEVICE AND METHOD FOR RADIO TRANSCEIVER APPARATUS

Yuzo Yoneyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 7, 1994, Ser. No. 271,740
Claims priority, application Japan, Jul. 7, 1993, 5-167569
Int. Cl.[6] H04B *17/00*
U.S. Cl. 455—67.1 **9 Claims**



1. A reception amplifier failure detecting device for a radio transceiver apparatus, comprising:

demultiplexing means for demultiplexing a transmission signal from a transmission system to an antenna, and also demultiplexing a reception signal from the antenna to a reception system;

reception amplification means, connected to an input stage of said reception system, for amplifying the reception signal demultiplexed by said demultiplexing means;

reception means for receiving an output signal from said reception amplification means;

electric field detecting means for detecting an electric field strength of a signal received by said reception means;

transmission means, constituting said transmission system, for outputting a transmission signal to said antenna via said demultiplexing means;

power control means for controlling transmission power of said transmission means on the basis of a standard transmission value, and outputting transmission power information; and

failure detecting means for performing failure determination by comparing electric field strength information from said electric field detecting means with a failure detection reference value set on the basis of a standard attenuation value set when a transmission signal from said transmission means leaks to said reception system in the demultiplexing means, a standard amplification value of said reception amplification means, and the transmission power information of said transmission means.

5,487,177

FM RECEIVER COMPRISING A CIRCUIT ARRANGEMENT FOR DETERMINING THE FIELD STRENGTH OF FM TRANSMITTERS

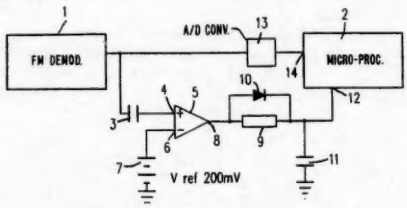
Heinz Lünter, Kinzenbach, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1993, Ser. No. 96,077

Claims priority, application Germany, Aug. 8, 1992, 42 26 346.8

Int. Cl.[6] H04B *17/00*

U.S. Cl. 455—67.3 **8 Claims**



1. In an FM receiver, a circuit for determining field strength of at least two FM transmitters operating at different frequencies, said circuit comprising:

an FM demodulator which produces at its output an output signal with a characteristic that indicates when the FM receiver is tuned to one or the other of said different frequencies, said output signal then having an amplitude value determined by the field strength of the FM transmitter to which the FM receiver is tuned,

a comparator having a first input coupled to the output of the FM demodulator and a second input coupled to a source of reference voltage, said comparator deriving at its output a binary output signal determined by said output signal characteristic,

an integrator stage having an input coupled to the output of the comparator and having an output at which is produced an activation signal only in response to said output signal characteristic of the FM demodulator, and

means for evaluating signals indicative of FM transmitter field strength and which has first and second inputs coupled to the output of the FM demodulator and to the output of the integrator stage, respectively, such that said first input of the evaluating signal means receives the FM demodulator output signal without a substantial delay.

5,487,178

RADIO SYSTEM BASE STATION INCLUDING PROVISION FOR GENERATING AND PROCESSING BOTH ANALOG AND DIGITAL RADIO LINK QUALITY MONITORING SIGNALS

Jouni Hänninen, Kiiminki, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

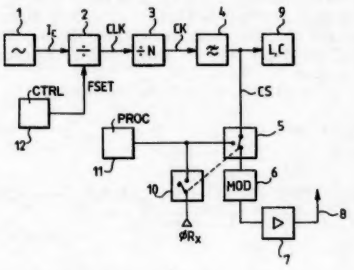
PCT No. PCT/FI92/00176, § 371 Date Feb. 5, 1993, § 102(e) Date Feb. 5, 1993, PCT Pub. No. WO92/22963, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 5, 1992, Ser. No. 983,591

Claims priority, application Finland, Jun. 11, 1991, 912804

Int. Cl.[6] H04B *7/26*

U.S. Cl. 455—67.4 **3 Claims**



1. A base station for a radio system, the base station comprising, for monitoring the quality of a radio link between the base station and mobile stations:

generator means for generating a square wave signal having a desired baseband monitoring signal frequency;

control means for setting the baseband frequency of the square wave signal;

a filter means for generating a baseband monitoring signal from the baseband square wave signal; and

a means for modulating the baseband monitoring signal to a transmitting frequency and for transmitting the transmitting frequency monitoring signal to the mobile radio station;

said control means comprising means for alternatively providing a first and a second mode of operation, the control means being arranged for controlling the generator means in the first mode of operation to transmit an analog monitoring signal by maintaining the baseband frequency of the square wave signal generated by the generator means at a constant value throughout the duration of the monitored radio link, and the control means being arranged for controlling the generator means in the second mode of operation to transmit a digital monitoring signal by varying the baseband frequency of the square wave signal generated by the generator means during the monitored radio link between a first baseband frequency corresponding to a first logical state and a second baseband frequency corresponding to a second logical state according to logical states to be transmitted;

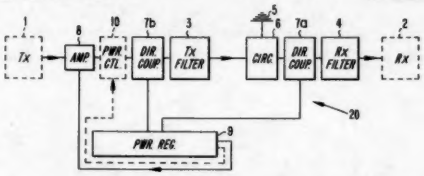
said generator means comprising an oscillator means and at least one adjustable divider circuit which is connected in series with the oscillator means and said filter means, and the frequency of the monitoring signal being determined by the divisor of said adjustable divider circuit.

5,487,179

ARRANGEMENT FOR DUPLEX TRANSMISSION HAVING TRANSMITTER POWER CONTROL

Jan A. Larsson, Torna Hällestad, Sweden, assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.

Filed Feb. 3, 1994, Ser. No. 191,170
Claims priority, application Sweden, Feb. 5, 1993, 9300349
Int. Cl.[6] H04B *1/48;1/04;* H01Q *11/12*
U.S. Cl. 455—69 17 Claims



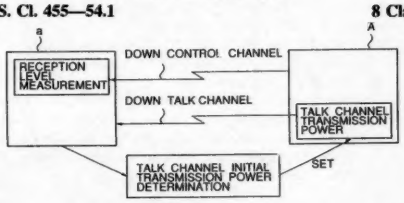
17. A communication apparatus comprising: a transmitter connected with a transmitter filter, a receiver connected with a receiver filter, and an antenna, the transmitter filter and the receiver filter being connected through a circulator, means for detecting power to be received by the receiver filter and means for controlling and regulating power produced by a power amplifier of the transmitter to thereby limit damage to the receiver filter.

5,487,180

METHOD OF DETERMINING INITIAL TRANSMISSION POWER

Koji Ohtake, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 17, 1994, Ser. No. 215,093
Claims priority, application Japan, Sep. 20, 1993, 5-256382
Int. Cl.[6] H04B *1/40*
U.S. Cl. 455—54.1 8 Claims



1. A method of determining an initial transmission power in a mobile communication system having a base station and at least one mobile station, a control channel leading from the base station to the mobile station and a talk channel leading from the base station to the mobile station, said method comprising the steps of:

(a) measuring, at the mobile station, a reception level of said control channel leading from the base station to the mobile station;

(b) obtaining a comparison result, at the mobile station, by comparing the measured reception level with a threshold value which is used to determine an initial transmission power value of said talk channel;

(c) determining, at the mobile station, the initial transmission power value of said talk channel based on the comparison result, and reporting the initial transmission power value of said talk channel to the base station; and

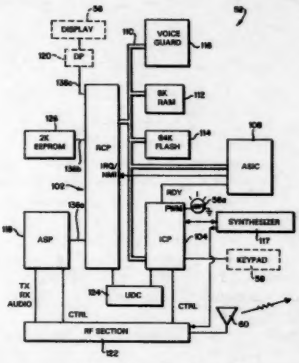
(d) setting, at the base station, the initial transmission power value of said talk channel, reported from the mobile station.

5,487,181

LOW POWER ARCHITECTURE FOR PORTABLE AND MOBILE TWO-WAY RADIOS

Timothy E. Dailey; Marc A. Dissosway, and Russell L. Croucher, all of Forest, Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Filed Oct. 28, 1992, Ser. No. 969,739
Int. Cl.[6] H04B *1/40;7/32*
U.S. Cl. 455—89 35 Claims



1. A battery powered portable radio transceiver comprising:

a housing;

an antenna mounted on said housing;

radio frequency circuitry, disposed within said housing and coupled to said antenna, for transceiving radio frequency signals over the air via said antenna, said radio frequency circuitry transmitting and receiving voice and data communications via an RF working channel and monitoring control signals on an RF control channel;

a processing device disposed within said housing, said processing device being switchable between an active mode and a software standby mode, said processing device performing tasks associated with said transceiving when in said active mode;

a controller, disposed within said housing, coupled to said radio frequency circuitry and connected to said processing device, said controller monitoring the RF control channel while the processing device is in the software standby mode and controlling said processing device to switch from said software standby mode to said active mode in response to at least one event associated with said transceiving; and

a battery removably coupled to said housing, said battery supplying power to said radio frequency circuitry, said processing device, and said controller,

wherein said housing including said radio frequency circuitry, processing device, and controller weighs about ten ounces or less, is not more than substantially four inches in length, and wherein current consumption is minimized in said standby mode.

5,487,182

HANDS-FREE MODULE

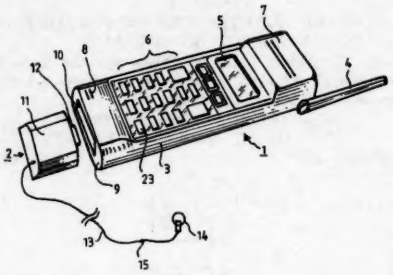
Hans M. Hansson, Lund, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 715,585, Jun. 14, 1991, abandoned.
This application Nov. 12, 1993, Ser. No. 181,350
Claims priority, application Sweden, Jun. 25, 1990, 9002243
Int. Cl.[6] H04B *1/38;* H04M *9/08*
U.S. Cl. 455—90 1 Claim

1. A hands-free module for use with a mobile telephone, comprising:

a first microphone means;

ear phone means;



first connection means for connecting the first microphone means and said ear phone means;

a hands-free module housing provided with an insertion portion adapted for insertion into an opening provided in a housing of said mobile telephone, said insertion portion having a cross section corresponding to that of said opening,

said hands-free module housing comprising:

microphone amplifier means for said first microphone means, limiter means for said ear phone means, and

second connector means for connecting said amplifier means and

said limiter means to microphone output means provided in said opening and for connecting said limiter means to loudspeaker output means provided in said opening.

5,487,183

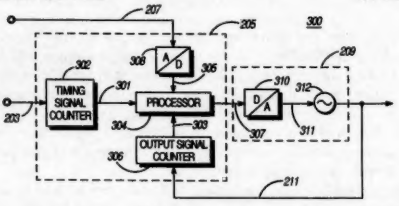
METHOD AND APPARATUS FOR A DATA TRANSMITTER

Peter Nanni, 1210 Countryside Dr., Algonquin, Ill. 60102; Steven J. Fink, 3850 Winston Dr., Hoffman Estates, Ill. 60195, and Jan P. Vanderspool, II, 8708 Bull Run Trail, Woodstock, Ill. 60098

Filed Apr. 4, 1994, Ser. No. 222,046

Int. Cl.[6] H04B *1/04*

U.S. Cl. 455—113 **14 Claims**



1. A data transmitter that includes a controllable oscillator operating nominally at a transmit frequency, an output of the controllable oscillator being modulated with an information signal, the data transmitter comprising:

means for receiving a precise timing signal, wherein the precise timing signal has a predetermined period;

converting means, arranged to receive the information signal, for converting the information signal into a digital information signal;

an output signal counter, arranged to receive the output of the controllable oscillator, for measuring transitions of the output of the controllable oscillator during the predetermined period to produce an output signal metric; and

a processor, operably coupled to the means for receiving, the converting means, the output signal counter, and the controllable oscillator, for computing a cumulative information metric which measures a cumulative effect of the digital information signal on the output of the controllable oscillator during the predetermined period and for computing a control metric based on the output signal metric, the cumulative information metric, and an expected output signal metric, wherein the control metric is used to correct the output of the controllable oscillator.

5,487,184

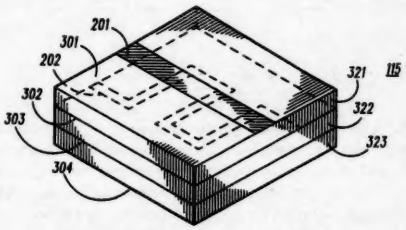
OFFSET TRANSMISSION LINE COUPLER FOR RADIO FREQUENCY SIGNAL AMPLIFIERS

Thomas D. Nagode, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 9, 1993, Ser. No. 150,504

Int. Cl.[6] H01P *5/10;* **H04B** *1/04*

U.S. Cl. 455—126 **22 Claims**



1. Radio frequency (RF) signal coupler circuitry for detecting an RF signal generated by a signal source and producing an RF detect signal, said RF signal coupler circuitry comprising:

a substrate having top and bottom surfaces and a predetermined dielectric constant;

a first transmission line having a predetermined shape and being disposed on the top surface of the substrate, the first transmission line coupled to the RF signal, the first transmission line having a predetermined width; and

a second transmission line disposed on the bottom surface of the substrate, the second transmission line having at least first and second portions electromagnetically coupled to the first transmission line for generating the RF detect signal having an amplitude related to the amplitude of the RF signal, the first and second portions of the second transmission line having a width less than tho predetermined width of the first transmission line, the first portion being offset a first predetermined distance to one side of the first transmission line, the second portion being offset a second predetermined distance to the other side of the first transmission line, the amount of coupling between the first portion and the first transmission line being substantially the same as the amount of coupling between the second portion and the first transmission line, and the second transmission line further having a third portion intercoupling the first and second portions.

5,487,185

METHOD FOR EXTENDING MEAN TIME BETWEEN FAILURES OF TRANSMITTERS USED IN A CELLULAR SYSTEM, BY INTERMITTENTLY SHIFTING AMONG THEM WHICH IS TRANSMITTING A CONTROL CHANNEL VERSUS WHICH IS TRANSMITTING A TRAFFIC CARRIER

Harri Halonen, Jääli, Finland, assignor to Nokia Telecommunications OY, Espoo, Finland

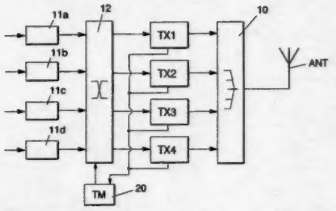
Filed Oct. 20, 1993, Ser. No. 137,128

Claims priority, application Finland, Feb. 24, 1992, 920793

Int. Cl.[6] H04B *1/04;* **H04Q** *7/30*

U.S. Cl. 455—127 **7 Claims**

1. A method for extending mean time between failures of a plurality of transmitters of a base station in a cellular system transmitting on at least one control channel at a higher average power level and transmitting on at least one traffic carrier at a lower average power level, compared with mean time between



failures for said plurality of transmitters when one of said transmitters is dedicated to transmitting on said at least one control channel, comprising:

while operating said cellular system, from time to time and independently of instigation due to occurrence of actual failure of any one of said transmitters, changing between or among which of said transmitters is or are being used for transmitting on said at least one control channel.

5,487,186

AUTOMATIC FREQUENCY CONTROL USING SPLIT-BAND SIGNAL STRENGTH MEASUREMENTS

Carl G. Scarpa, Edison, N.J., assignor to Hitachi America, Ltd., Tarrytown, N.Y.

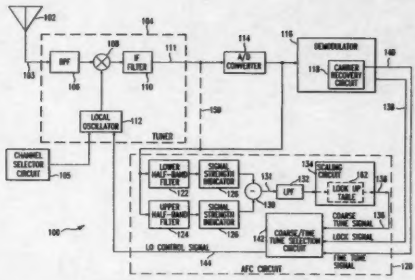
Continuation of Ser. No. 83,630, Jun. 28, 1993, abandoned. This application Jan. 4, 1995, Ser. No. 368,747

Int. Cl.[6] **H04B** *1/16*

U.S. Cl. 455—192.2 **22 Claims**

1. In a communications receiver having a tuner containing a frequency tunable local oscillator, and a demodulator, wherein the tuner mixes an output frequency of the local oscillator with a received signal to generate an intermediate frequency (IF) signal for application to the demodulator, the received and IF signals have an equal modulation bandwidth and first and second center frequencies, respectively, and wherein the first and second center frequencies are different, apparatus for generating a frequency control signal applied to the tuner for tuning the output frequency provided by the local oscillator in order to bring the second center frequency into coincidence with a pre-defined frequency for the IF signal, the apparatus comprising:

a first filter, connected to said tuner, for filtering the IF signal so as to produce a first filtered signal, said first filter having a



first pre-defined frequency characteristic with a first bandwidth equivalent to a pre-defined upper portion of the modulation bandwidth and a third center frequency set to a frequency higher than the second center frequency;

a second filter, connected to said tuner, for filtering said IF signal so as to produce a second filtered signal, said second filter having a second pre-defined frequency characteristic with a second bandwidth equivalent to a pre-defined lower portion of the modulation bandwidth and a fourth center frequency set to a frequency below the second center frequency, wherein the upper and lower portions represent separate substantially non-overlapping portions of the modulation bandwidth;

means, connected to both said first and second filters, for producing a first tuning signal responsive to a difference, in terms of signal strength, between said first and second filtered signals;

a carrier recovery circuit, operative in conjunction with the demodulator, for producing a second tuning signal for adjusting, within a pre-defined capture range of the demodulator, the output frequency of the local oscillator so that the second center frequency coincides with the pre-defined frequency for the IF signal; and

means, connected to both the first and second tuning signals and responsive to the demodulator, for selecting, as the frequency control signal, either the first or second tuning signals whenever the second center frequency lies respectively outside of or within the capture range of the demodulator whereby the first and second tuning signals function to provide coarse and fine tuning, respectively, of the output frequency of the local oscillator.

DESIGN PATENTS

GRANTED JAN. 23, 1996

ERRATA

For CLASS	See PATENT NO.
D11–006	D366,449
D11–155	D366,450
D11–162	D366,451
D12–165	D366,485

DESIGNS

JANUARY 23, 1996

366,351

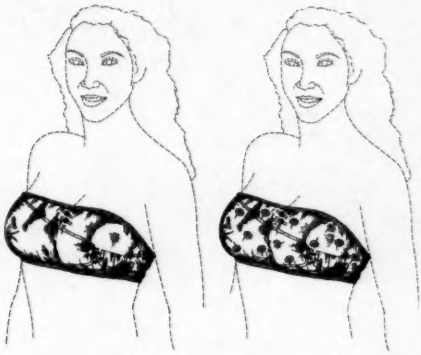
BRASSIERE

Claude C. Winchell, P.O. Box 100, First National Bank Trust Department, Russellville, Ark. 72801

Filed Dec. 9, 1994, Ser. No. 32,264

Term of patent 14 years

U.S. Cl. D2—706



366,352

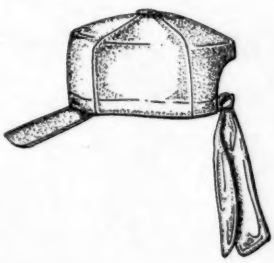
HAT

Andrew H. Shoemaker, 13733 127th St. N., Stillwater, and William K. Paatalo, 1685 Regatta Dr., Woodbury, both of Minn. 55125

Filed Sep. 21, 1994, Ser. No. 28,742

Term of patent 14 years

U.S. Cl. D2—874



366,353

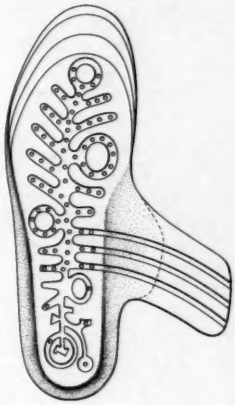
INNER SOLE

Joseph P. Famolare, Jr., R.R. 4, Windmill Hill Rd., Putney, Vt. 05346

Filed Apr. 29, 1994, Ser. No. 22,195

Term of patent 14 years

U.S. Cl. D2—961



366,354

SHOE SOLE

Kazumasa Yoshikawa, Osaka; Katsuhiko Uno, and Wataru Ueda, both of Kobe, all of, Japan, assignors to Asics Corporation, Hyogo, Japan

Filed Sep. 6, 1994, Ser. No. 27,992

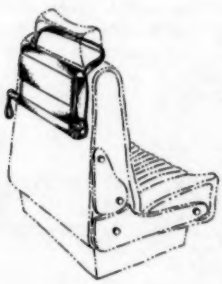
Claims priority, application Japan, Mar. 9, 1994, 6-6192

Term of patent 14 years

U.S. Cl. D2—953

366,355
NECKTIE
Michael P. Wade, 3304 Shakertown Ct., Antioch, Tenn. 37013
Filed Nov. 28, 1994, Ser. No. 31,447
Term of patent 14 years
U.S. Cl. D2—607

366,356
AUTOMOBILE ACCESSORY
Ronald A. Theis, West Bend, Wis., assignor to Amity Leather Products Company, West Bend, Wis.
Continuation of Ser. No. 6,795, Apr. 7, 1993, abandoned. This application Dec. 16, 1994, Ser. No. 32,396
Term of patent 14 years
U.S. Cl. D3—11

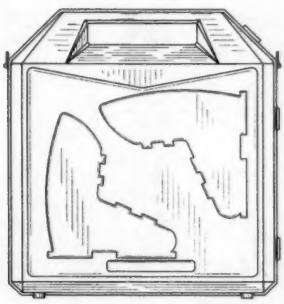


366,357
KEY RING HOLDER
Brian K. Prothro, 8427 Rock Cliff Dr., Jonestown, Tex. 78645
Filed Jun. 4, 1993, Ser. No. 9,112
Term of patent 14 years
U.S. Cl. D3—207

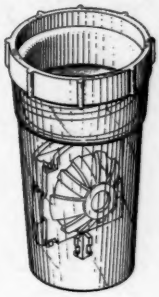
366,358
TIMER KEY RING
Barbara Ravizza, 2663 Union St., San Francisco, Calif. 94123
Filed Aug. 26, 1994, Ser. No. 27,687
Term of patent 14 years
U.S. Cl. D3—211

366,359
KEY CHAIN
Harry Riedl, Commingenstrasse 13, D-75242 Neuhausen-Steinegg, Germany
Filed Oct. 20, 1994, Ser. No. 29,966
Claims priority, application Germany, Apr. 30, 1994, 94 03 730.2; Aug. 18, 1994, 94 06 547.0
Term of patent 14 years
U.S. Cl. D3—211

366,360
CARRYING CASE FOR SKIBOOTS
Robert C. Vincent, 104 Rose Twig La., North Wales, Pa. 19454
Filed Feb. 24, 1994, Ser. No. 19,149
Term of patent 14 years
U.S. Cl. D3—261



366,361
CONTACT LENS CASE
Rowland W. Kanner, Guntersville; Stephen P. Lisak, and Terry B. Kehne, both of Arab, all of Ala., assignors to Ryder International Corporation, Arab, Ala.
Division of Ser. No. 9,753, Jun. 18, 1993, Pat. No. Des. 356,591, which is a continuation of Ser. No. 13,812, Feb. 2, 1993, abandoned. This application Jul. 1, 1994, Ser. No. 25,429
Term of patent 14 years
U.S. Cl. D3—264



366,362
WOVEN BASKET
June M. Napier, and Jeffrey B. Napier, both of 5600 Glenwood Ave., Raleigh, N.C. 27612
Filed Jun. 6, 1994, Ser. No. 20,639
Term of patent 14 years
U.S. Cl. D3—306

366,363

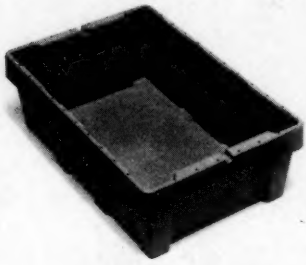
CONTAINER

Teunis J. (Tony) Berggren, Skillinge, Sweden, assignor to Aktiebolaget Volvo, Gothenburg, Sweden

Filed May 20, 1994, Ser. No. 23,251

Term of patent 14 years

U.S. Cl. D3—314



366,364

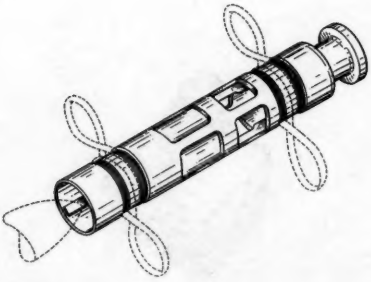
AMMUNITION CARRIER TUBE

Stephen Pollock, Tallahassee, Fla., assignor to Syn-Tech Systems, Inc., Tallahassee, Fla.

Filed Feb. 2, 1994, Ser. No. 18,229

Term of patent 14 years

U.S. Cl. D3—316



366,365

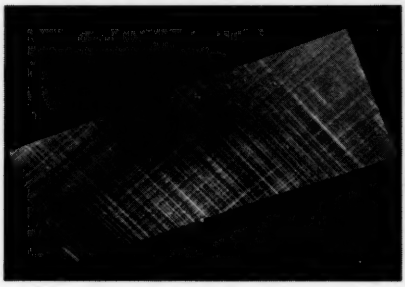
COATED ABRASIVE SHEET ARTICLE

Timothy L. Hoopman, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 11, 1994, Ser. No. 22,718

Term of patent 14 years

U.S. Cl. D5—4



366,366

CLOSET GARMENT HANGER

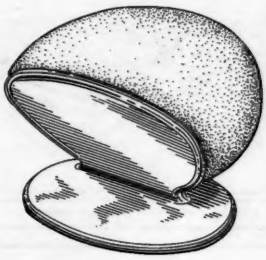
Anthony Restaino, 2 Harriet La., Plainview, N.Y. 11803

Filed Sep. 2, 1994, Ser. No. 28,023

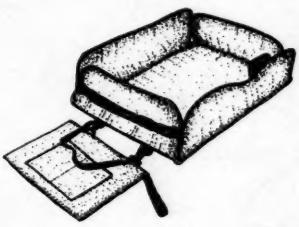
Term of patent 14 years

U.S. Cl. D6—315

366,367
V-BASE OTTOMAN
Michael S. Reese, P.O. Box 163241, Austin, Tex. 78716
Filed Jan. 3, 1995, Ser. No. 33,009
Term of patent 14 years
U.S. Cl. D6—349

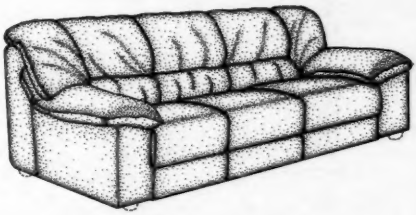


366,368
PORTABLE INFANT BED AND CHANGING PAD
Adam D. McCarthy, 3001-20 Inland Trail, Raleigh, N.C. 27613
Filed Dec. 12, 1994, Ser. No. 32,018
Term of patent 14 years
U.S. Cl. D6—333



366,369
CHAIR
Sami Sagol, Ramat HaSharon, Israel, assignor to Keter Plastic LTD, Herzlyia, Israel
Filed Sep. 1, 1994, Ser. No. 27,905
Claims priority, application Israel, Mar. 3, 1994, 22290
Term of patent 14 years
U.S. Cl. D6—368

366,370
SEAT
Pasquale Natuzzi, Santeramo In Colle, and Arcangelo Scarati, Talsano, both of, Italy, assignors to Industrie Natuzzi SPA, Bari, Italy
Filed Jun. 30, 1994, Ser. No. 25,341
Term of patent 14 years
U.S. Cl. D6—381



366,371

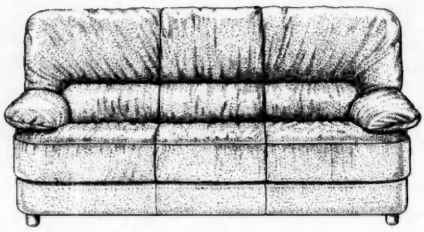
SOFA

Pasquale Natuzzi, Santeramo In Colle, and Arcangelo Scarati, Talsano, both of, Italy, assignors to Industrie Natuzzi Spa, Bari, Italy

Filed Apr. 11, 1994, Ser. No. 21,160

Term of patent 14 years

U.S. Cl. D6—381



366,372

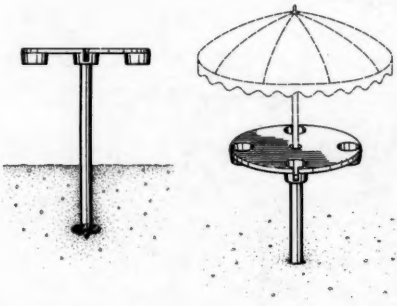
GROUND INSERTED BEACH TABLE

James F. Skarda, Jr., 4532 Todd Point La., Baltimore, Md. 21219

Filed Feb. 16, 1994, Ser. No. 18,798

Term of patent 14 years

U.S. Cl. D6—417



366,373

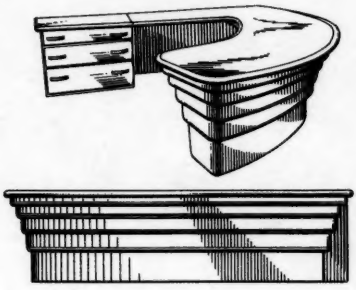
CURVED PEDESTAL DESK

Michael S. Reese, P.O. Box 163241, Austin, Tex. 78716

Filed Dec. 8, 1994, Ser. No. 31,931

Term of patent 14 years

U.S. Cl. D6—427



366,374

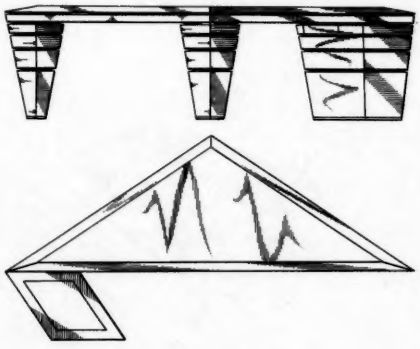
STACKED PEDESTAL DESK

Michael S. Reese, P.O. Box 163241, Austin, Tex. 78716

Filed Nov. 4, 1994, Ser. No. 30,666

Term of patent 14 years

U.S. Cl. D6—427



366,375

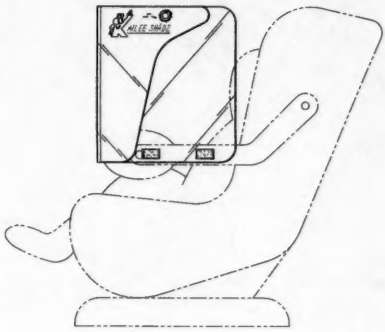
INFANT-SEAT ATTACHABLE SUNSHIELD AND PROTECTIVE BARRIER

Thomas J. Cross, 11422 Scott Dr., Fredricksburg, Va. 22407

Filed May 15, 1995, Ser. No. 38,884

Term of patent 14 years

U.S. Cl. D6—491



366,376

MID-SIZE FOOTBALL LOCKER

Thomas A. Tisbo, Barrington Hills; Stephen P. Whitehead, Elgin, and Lyle A. Rosine, Aurora, all of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed May 5, 1994, Ser. No. 22,466

Term of patent 14 years

U.S. Cl. D6—434

366,377

BASE FOR AN OFFICE CHAIR

Ludovic A. Perl, Willowdale, Canada, assignor to Shepherd Products Inc., Ontario, Canada

Filed Mar. 17, 1994, Ser. No. 20,129

Term of patent 14 years

U.S. Cl. D6—498

366,378

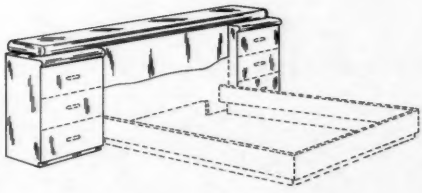
BED HEADBOARD

Carlo Bargagli-Stoffi, Union, N.J., assignor to San Giacomo N.A. Ltd., Union, N.J.

Filed Oct. 11, 1994, Ser. No. 29,604

Term of patent 14 years

U.S. Cl. D6—505



366,379

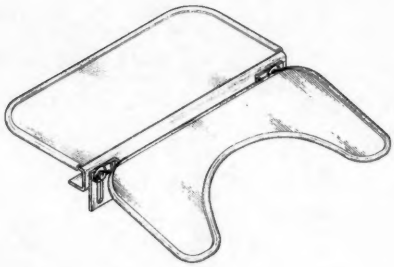
WORK STATION UPPER BODY SUPPORT

Mark Graeber, Everett, Wash., assignor to Promark, Inc., Seattle, Wash.

Filed Mar. 31, 1994, Ser. No. 20,740

Term of patent 14 years

U.S. Cl. D6—511



366,380

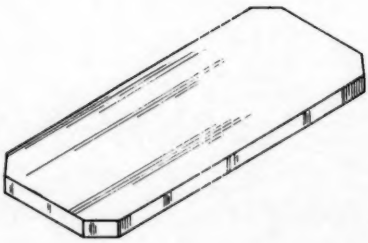
MULTIPLE USE ACTIVITY PAD

Ray G. Kelly, St. Louis County, Mo., assignor to Angeles Group, Inc., Pacific, Mo.

Division of Ser. No. 651,508, Feb. 6, 1991, Pat. No. Des. 350,237. This application Jun. 24, 1994, Ser. No. 24,958

Term of patent 14 years

U.S. Cl. D6—511



366,381

HOLDER FOR TOILET TISSUE ROLLS

Ramona B. Espinal, 1275 Broad St., Providence, R.I. 02905

Filed May 26, 1994, Ser. No. 23,567

Term of patent 14 years

U.S. Cl. D6—520

366,382

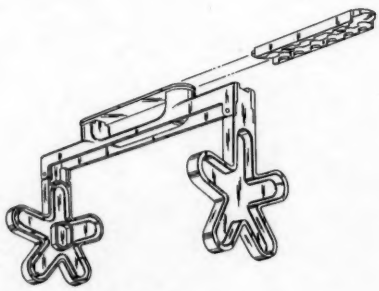
PAPER TOWEL DISPENSER

Louis D. Carillo, 22672 Lambert St., No. 620, Lake Forest, Calif. 92630

Filed Jan. 13, 1995, Ser. No. 33,472

Term of patent 14 years

U.S. Cl. D6—522



366,383

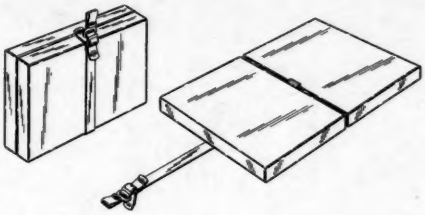
FOLDING ATTACHABLE SEAT CUSHION

Kenneth B. Briegleb, 7817 NE. 379th St., La Center, Wash. 98629, assignor to Kenneth B. Briegleb, La Center, Wash.

Filed Nov. 25, 1994, Ser. No. 31,388

Term of patent 14 years

U.S. Cl. D6—601



366,384

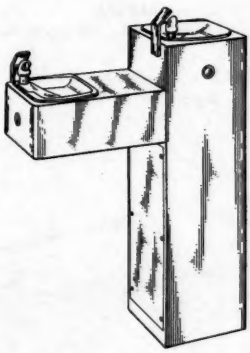
PEDESTAL MOUNTED DRINKING FOUNTAIN

Matthew I. Stein, Truckee, Calif., assignor to Haws Company, Sparks, Nev.

Division of Ser. No. 9,656, Jun. 21, 1993, Pat. No. Des. 356,229. This application Sep. 27, 1994, Ser. No. 29,008

Term of patent 14 years

U.S. Cl. D7—304



366,385

ELECTRIC COFFEE MAKER

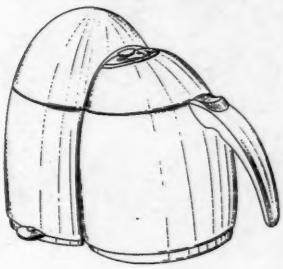
Alberto Alessi Anghii, Omegna; Alessandro Mendini, Milan, both of, Italy, and Chin Leong, Groningen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 4, 1994, Ser. No. 26,773

Claims priority, application Switzerland, Jul. 2, 1994, DM/029.477

Term of patent 14 years

U.S. Cl. D7—309



366,386

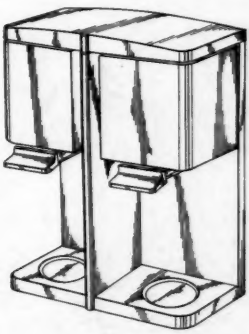
DISPENSER

David Riemer, c/o Sweetchoice Corporation, 700 E. Industrial Park Dr., and Robert S. Treisman, c/o TBI Corporation, 700 E. Industrial Park Dr., both of Manchester, N.H. 03109

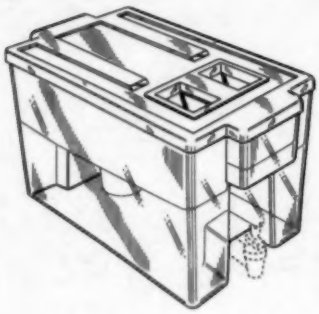
Filed May 4, 1994, Ser. No. 22,426

Term of patent 14 years

U.S. Cl. D7—311

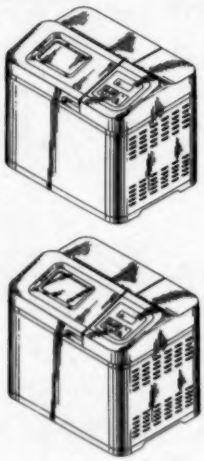


366,387
WATER COOLER
Richard D. Malmborg, San Ramon; Marcy A. Radlauer, San Francisco, both of Calif.; Curtis M. Berry, El Paso, Tex., and Jay L. Flom, Albany, Calif., assignors to The Clorox Company, Oakland, Calif.
Filed Oct. 28, 1994, Ser. No. 30,409
Term of patent 14 years
U.S. Cl. D7—313



366,388
ELECTRIC WATER KETTLE
Alberto Alessi Anghini, Omegna; Allessandro Mendini, Milan, both of, Italy, and Roger N. Swales, Groningen, Netherlands, assignors to U.U.S. Philips Corporation, New York, N.Y.
Filed Aug. 4, 1994, Ser. No. 26,730
Claims priority, application Switzerland, Feb. 7, 1994, DM/029.477
Term of patent 14 years
U.S. Cl. D7—317

366,389
HOUSEHOLD BAKER
Tsunemichi Inoue, Osaka, Japan, assignor to Zojirushi Corp., Osaka, Japan
Filed Jun. 29, 1994, Ser. No. 25,300
Claims priority, application Japan, Apr. 13, 1994, 6-10533
Term of patent 14 years
U.S. Cl. D7—350



366,390
GRIDDLE
Louis A. Vitantonio, Mentor, Ohio, assignor to Kadee Products Ltd., Solon, Ohio
Filed Nov. 22, 1993, Ser. No. 15,617
Term of patent 14 years
U.S. Cl. D7—363

366,391

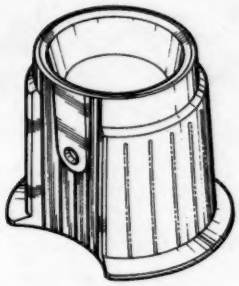
WATER DISPENSER

Vincent L. Haley, Orrville; Dennis K. Jenkins, Medina, and Rodney A. Nester, Wooster, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 12, 1994, Ser. No. 32,000

Term of patent 14 years

U.S. Cl. D7—397



366,392

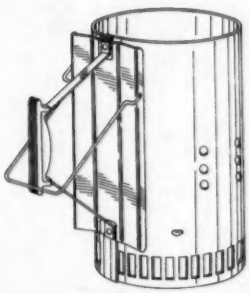
CHARCOAL IGNITER

James C. Stephen, Arlington Heights; Erich J. Schlosser, Barrington, and Ewald Sieg, Palatine, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Jul. 29, 1994, Ser. No. 26,528

Term of patent 14 years

U.S. Cl. D7—417



366,393

STEMWARE

David A. Harrison, Newton, and Richard J. Hughes, Morrisville, both of Pa., assignors to Lenox, Incorporated, Lawrenceville, N.J.

Filed Jan. 31, 1994, Ser. No. 18,125

Term of patent 14 years

U.S. Cl. D7—522

366,394

DRINKS TRAY

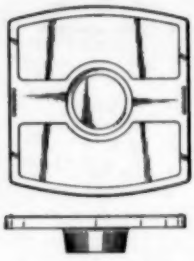
Chris Kypreos, 8 Elston St., Brooklyn Park, SA 5032, Australia

Filed Apr. 26, 1994, Ser. No. 21,915

Term of patent 14 years

U.S. Cl. D7—543

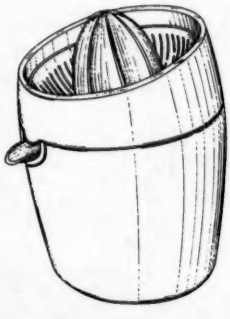
366,395
PARTY TRAY
William B. Wyatt, Brentwood, and Steven A. Silverstein, Nashville, both of Tenn., assignors to Aladdin Synergetics, Inc., Nashville, Tenn.
Filed Aug. 5, 1994, Ser. No. 26,806
Term of patent 14 years
U.S. Cl. D7—554



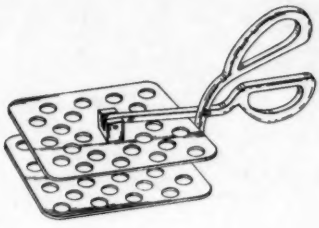
366,396
BOTTLE WRAP
Michael L. F. Chan, 1407 Arch St., Berkeley, Calif. 94708
Filed Aug. 12, 1994, Ser. No. 27,106
Term of patent 14 years
U.S. Cl. D7—624

366,397
STORAGE CONTAINER
Larry G. Zimmerman, Hollis, N.H., assignor to Sterilite Corporation, Townsend, Mass.
Filed Aug. 22, 1994, Ser. No. 27,462
Term of patent 14 years
U.S. Cl. D7—629

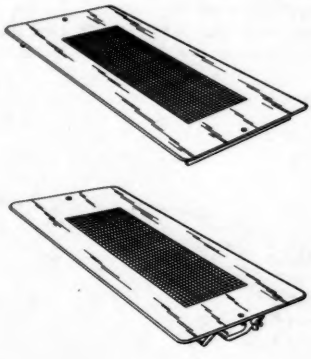
366,398
ELECTRIC CITRUSPRESS
Alberto Alessi Anghini, Omegna; Alessandro Mendini, Milan, both of, Italy, and Seiya Ohta, Hanover, Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 4, 1994, Ser. No. 26,771
Claims priority, application Hague Agreement, Feb. 7, 1994, DMA002421
Term of patent 14 years
U.S. Cl. D7—665



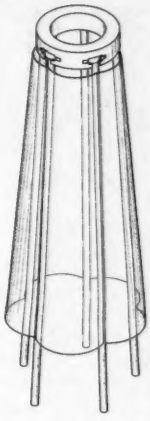
366,399
FOOD HANDLING TONGS
Alfred LaBoccetta, 3412 W. Schoolhouse La., Philadelphia, Pa. 19144
Filed May 16, 1994, Ser. No. 22,945
Term of patent 14 years
U.S. Cl. D7—687



366,400
FISH AND BAIT CUTTING BOARD FOR ATTACHMENT TO A BOAT
William M. Dentsbier, 716 Teson, St. Louis, Mo. 63042
Filed Apr. 12, 1993, Ser. No. 6,891
Term of patent 14 years
U.S. Cl. D7—698



366,401
PLANT COVER
Robert L. Smith, 120 E. Elm, Algoha, Iowa 50511
Filed Nov. 4, 1994, Ser. No. 30,698
Term of patent 14 years
U.S. Cl. D8—1



366,402
COMBINATION CAULKING TUBE CAP AND APPLICATOR
David E. Groene, Centerville, Ohio, and Earl E. Hoyt, Franklin Lakes, N.J., assignors to Dap Products, Inc., Dayton, Ohio
Division of Ser. No. 6,707, Apr. 5, 1993, Pat. No. D. 355,576.
This application Oct. 13, 1994, Ser. No. 29,672
Term of patent 14 years
U.S. Cl. D8—14.1

366,403

ELECTRIC FENCE WIRE INSULATOR TOOL

M. Deon Yearwood, Rte. 2, Box 23, Hydro, Okla. 73048

Filed Nov. 1, 1994, Ser. No. 30,559

Term of patent 14 years

U.S. Cl. D8—27

366,404

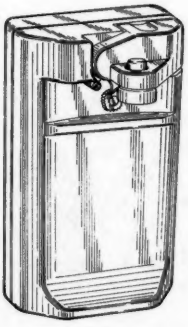
CAN OPENER

Antonio Indindoli, San Jose, Calif., assignor to The Rival Company, Kansas City, Mo.

Filed Apr. 5, 1994, Ser. No. 20,896

Term of patent 14 years

U.S. Cl. D8—36



366,405

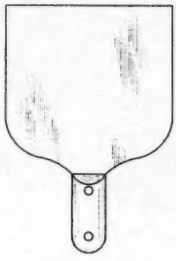
PUTTY PADDLE

Randy D. Stevens, 504 Quandary Ave., P.O. Box 114, Flagler, Colo. 80815

Filed Mar. 18, 1994, Ser. No. 20,115

Term of patent 14 years

U.S. Cl. D8—45



366,406

SANDER

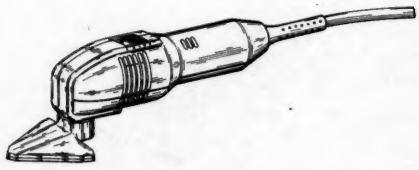
Naoki Kikuchi, Chandler, Ariz., assignor to Ryobi Outdoor Products, Chandler, Ariz.

Continuation of Ser. No. 20,503, Mar. 28, 1994, abandoned.

This application Feb. 27, 1995, Ser. No. 35,427

Term of patent 14 years

U.S. Cl. D8—62



366,407

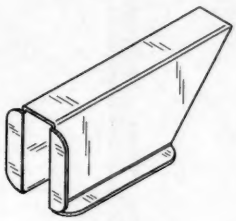
COMPACT DISC PACKAGING OPENER

Steven M. Kendall, 10341 Forest Brook, Unit H, St. Louis, Mo. 63146, and Gordon W. Gosh, 824 Bricken Pl., Warson Woods, Mo. 63122

Filed Dec. 21, 1994, Ser. No. 32,579

Term of patent 14 years

U.S. Cl. D8—98



366,408

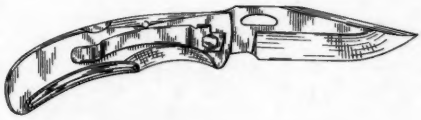
FOLDING KNIFE

George C. Sessions, Milwaukie, and Bradford J. Parrish, Oregon City, both of Oreg., assignors to Fiskars Inc., Madison, Wis.

Filed Aug. 18, 1994, Ser. No. 27,298

Term of patent 14 years

U.S. Cl. D8—99



366,409

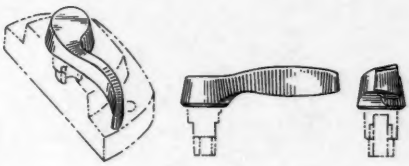
WINDOW SASH LOCK HANDLE

Robbin J. Delaske, Waterville, Minn., assignor to Truth Hardware Corporation, Owatonna, Minn.

Filed Sep. 30, 1994, Ser. No. 29,222

Term of patent 14 years

U.S. Cl. D8—338



366,410

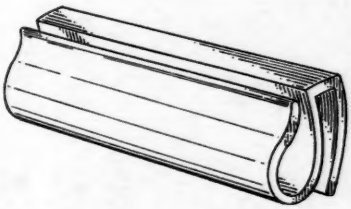
T-RAIL WIRE RETAINER CLIP

Dennis Schlabach, P.O. Box 191, Millersburg, Ohio 44654

Filed Feb. 16, 1994, Ser. No. 18,902

Term of patent 14 years

U.S. Cl. D8—395



366,411

CONTAINER FOR PRESERVED SEAFOOD

Diana G. Wilson, North Vancouver, and Clarence A. Wells, Vancouver, both of, Canada, assignors to Pacific Salmon Industries, Inc., Surrey, Canada

Filed Sep. 1, 1994, Ser. No. 27,936

Term of patent 14 years

U.S. Cl. D9—311

366,412

CARTON

Gregory C. Peischl, Bethel, Conn., and Eugene R. Sylva, New Vernon, N.J., assignors to Clairol, Inc., New York, N.Y.

Filed Dec. 21, 1994, Ser. No. 32,540

Term of patent 14 years

U.S. Cl. D9—415

366,413

CANISTER

C. David Tober, 4092 E. Britain Ave., Benton Harbor, Mich. 49022-9727

Filed Feb. 24, 1994, Ser. No. 19,139

Term of patent 14 years

U.S. Cl. D9—429

366,414

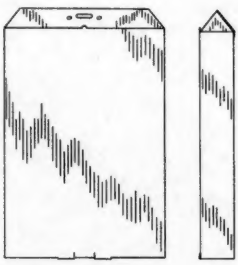
GARMENT BAG BOX

Joseph J. Dlugopolski, Lombard, Ill., assignor to Fidelity Container Corporation, Elk Grove Village, Ill.

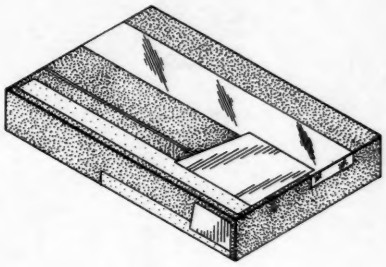
Continuation-in-part of Ser. No. 16,385, Dec. 13, 1993, abandoned. This application Apr. 13, 1994, Ser. No. 21,312

Term of patent 14 years

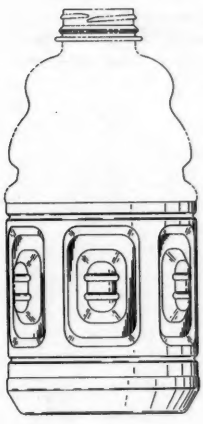
U.S. Cl. D9—432



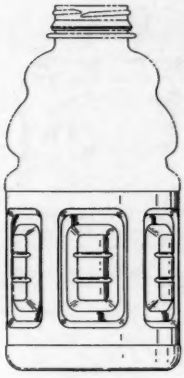
366,415
TAPE CASSETTE PACKAGE
Yoshie Nagasaka, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan
Filed May 18, 1994, Ser. No. 23,137
Term of patent 14 years
U.S. Cl. D9—432



366,416
CONTAINER SIDEWALL AND BASE
Frank E. Semersky, Toledo, Ohio, assignor to Graham Packaging Corporation, York, Pa.
Filed Mar. 1, 1995, Ser. No. 35,527
Term of patent 14 years
U.S. Cl. D9—434



366,417
CONTAINER SIDEWALL AND BASE
Frank E. Semersky, Toledo, Ohio, assignor to Graham Packaging Corporation, York, Pa.
Filed Mar. 1, 1995, Ser. No. 35,526
Term of patent 14 years
U.S. Cl. D9—434



366,418
CONTAINER CLOSURE CAP
John M. Lown, Huntington Beach; Gregory F. Quinn, Fullerton, and Robert P. Mayercheck, Irvine, all of Calif., assignors to FloTool International, Inc., Tustin, Calif.
Filed Mar. 28, 1994, Ser. No. 20,518
Term of patent 14 years
U.S. Cl. D9—449

366,419

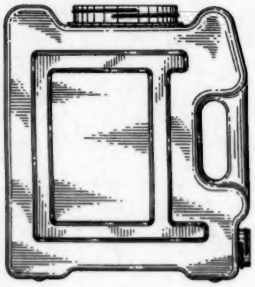
CONTAINER FOR BEVERAGES

Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.

Filed Sep. 12, 1994, Ser. No. 28,261

Term of patent 14 years

U.S. Cl. D9—520



366,420

PERFUME FLACON

Ellen Gavin, Atlantic Highlands, N.J., assignor to Cosmair, Inc., New York, N.Y.

Filed May 27, 1994, Ser. No. 23,636

Term of patent 14 years

U.S. Cl. D9—521

366,421

BOTTLE

Robert C. Best, Withamsville, Ohio, assignor to The Procter and Gamble Company, Cincinnati, Ohio

Filed Dec. 19, 1994, Ser. No. 32,462

Term of patent 14 years

U.S. Cl. D9—542

366,422

BOTTLE WITH CAP

Marc Gobe, New York, N.Y., assignor to Victoria's Secret Stores, Inc., Columbus, Ohio

Filed Dec. 5, 1994, Ser. No. 31,757

Term of patent 14 years

U.S. Cl. D9—544

366,423

ROTATABLE DISPLAY UNIT

Junji Hiromori, Tokyo, Japan, assignor to Hiromori Inc., Tokyo, Japan

Filed Feb. 9, 1994, Ser. No. 18,524

Term of patent 14 years

U.S. Cl. D10—2

366,424

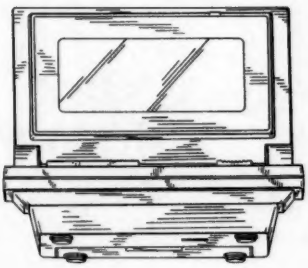
LCD ALARM CLOCK

Shu K. Wong, Hong Kong, Hong Kong, assignor to Ballanda Limited, Hong Kong

Filed Jan. 10, 1995, Ser. No. 33,317

Term of patent 14 years

U.S. Cl. D10—15



366,425

WRISTWATCH AND PULSE RATE MONITOR

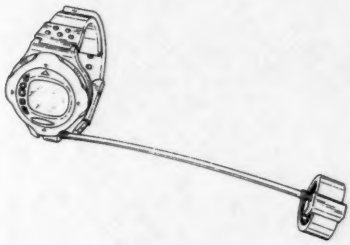
Masanao Hirose, Suwa, Japan, assignor to Seiko Epson Corporation, Shinjuku, Japan

Filed Nov. 7, 1994, Ser. No. 31,192

Claims priority, application Japan, May 6, 1994, 6-12940

Term of patent 14 years

U.S. Cl. D10—31



366,426

WRIST WATCH

Kazuyasu Kojima, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

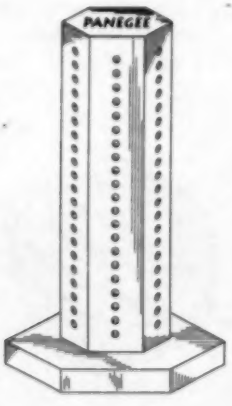
Filed Feb. 15, 1995, Ser. No. 34,910

Term of patent 14 years

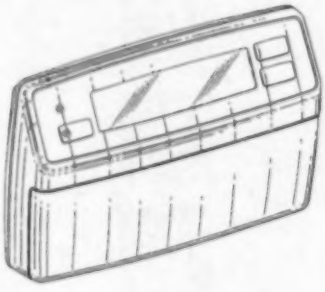
U.S. Cl. D10—39

366,427
DESIGN FOR A WATCH
Jean-Louis Dumas, Paris, France, assignor to La Montre Hermes, S.A., Bienne, Switzerland
Filed Mar. 8, 1993, Ser. No. 5,595
Claims priority, application WIPO, Sep. 8, 1992, DM/023 840
The portion of the term of this patent subsequent to May 9, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—39

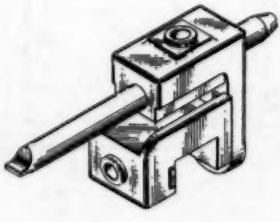
366,428
GAME SCORING TOWER
John Hulse, and Steve Wren, both of 4 Harrow Ave, Lansvale 2166 N.S.W., Australia
Filed Sep. 12, 1994, Ser. No. 28,253
Term of patent 14 years
U.S. Cl. D10—46.1



366,429
THERMOSTAT HOUSING
Andrea E. Dexter, Renton, Wash.; James E. Erickson, Eagan, Minn.; James A. Odom, Apple Valley, Minn.; Guy M. Shoultz, Delano, Minn., and N. Thomas Wolfe, Golden Valley, Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 2, 1994, Ser. No. 28,039
Term of patent 14 years
U.S. Cl. D10—50



366,430
PRESS BRAKE GAUGE
John J. Grundi, 2341 Eastgate Pl., Glendale, Calif. 91208
Filed Dec. 13, 1994, Ser. No. 32,066
Term of patent 14 years
U.S. Cl. D10—65



366,431

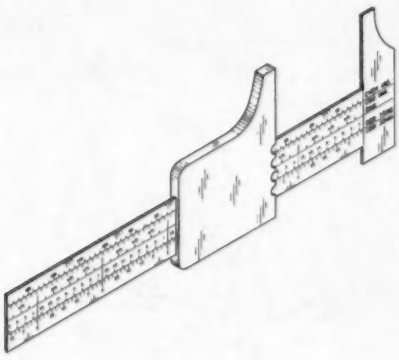
SIMPLIFIED EASY TO READ CALIPER

James Y. Saka, 2265 Gondar Ave., Long Beach, Calif. 90815

Filed May 19, 1995, Ser. No. 39,071

Term of patent 14 years

U.S. Cl. D10—73



366,432

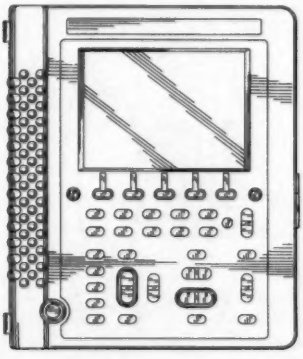
ELECTRONIC MEASUREMENT INSTRUMENT

Jerry L. Wrisley, Beaverton; Keith W. Kirkwood, Portland, and David T. Rosette, Tigard, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Mar. 3, 1995, Ser. No. 35,666

Term of patent 14 years

U.S. Cl. D10—78



366,433

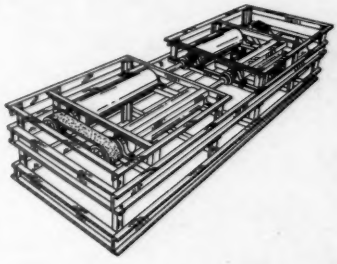
MULTIPLE FUNCTION CHASSIS DYNAMOMETER

Philip F. Evans, 447 King Rd., West Chester, Pa. 19380, and C. Eugene Hutcheson, 57 W. 58th St.- Apt. 3G, New York, N.Y. 10019

Filed Feb. 18, 1994, Ser. No. 18,926

Term of patent 14 years

U.S. Cl. D10—83



366,434

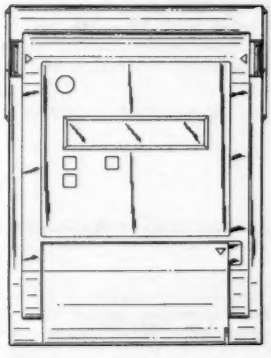
ELECTRONIC POWER METER AND DISPLAY

Donald R. Brown, III, Farmington, Conn., and Roy Watson, Pittsfield, Mass., assignors to General Electric Company, New York, N.Y.

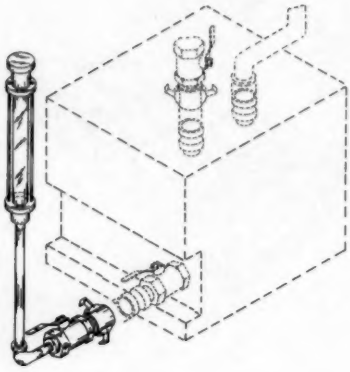
Filed Oct. 17, 1994, Ser. No. 29,768

Term of patent 14 years

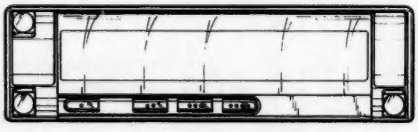
U.S. Cl. D10—99



366,435
SIGHT GLASS GAUGE FOR FILLING STORAGE TANKS
Keith Malcolm, P.O. Box 131, Franklin, N.H. 03235
Filed Apr. 3, 1995, Ser. No. 37,035
Term of patent 14 years
U.S. Cl. D10—96

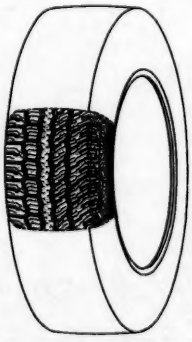


366,436
TAXIMETER
Andreas Blottko, and Reinhard Renner, both of Esslingen, Germany, assignors to VDO Kienzle GmbH, Villingen-Shwennungen, Germany
Continuation-in-part of Ser. No. 13,394, Sep. 23, 1993, abandoned. This application Feb. 1, 1995, Ser. No. 34,305
Claims priority, application Germany, Mar. 23, 1993, 93 02 317
Term of patent 14 years
U.S. Cl. D10—97



366,437
JET SKI LIFT FOR A TRAILER
Kelan D. Johnson, 261 Lamar St., Myrtle Creek, Oreg. 97457
Filed Dec. 30, 1994, Ser. No. 32,885
Term of patent 14 years
U.S. Cl. D12—106

366,438
TIRE
Eileen A. McKisson, Akron, Ohio, assignor to Michelin Recherche et Technique S.A., Granges-Paccot, Switzerland
Filed Dec. 6, 1993, Ser. No. 16,045
Term of patent 14 years
U.S. Cl. D12—146



366,439

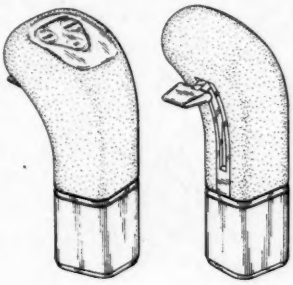
GEAR SHIFT LEVER WITH CRUISE CONTROL

Charles E. Allen, Jr., Rochester Hills, and Frank A. Palmeri, Troy, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sep. 20, 1994, Ser. No. 28,719

Term of patent 14 years

U.S. Cl. D12—179



366,440

VISOR MIRROR WITH DAY AND DATE INDICATORS

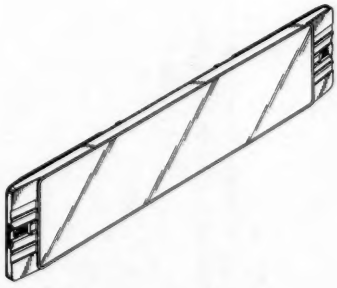
Wing K. Tong, Chi Wah Ind.Bldg. 1-7 Kin Hon Str., Kwai Chung, Hong Kong

Filed Jun. 16, 1993, Ser. No. 9,521

Claims priority, application United Kingdom, May 10, 1993, 2030938

Term of patent 14 years

U.S. Cl. D12—191



366,441

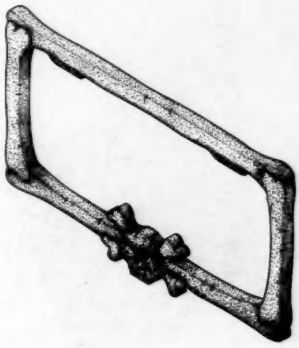
DECORATIVE FRAME FOR LICENSE PLATE

Chun-Feng Wu, No. 782, Wen-Shyan Rd., Pao An Tsun, Jen-Te Hsiang, Tainan Hsien, Taiwan, Prov. of China

Filed Mar. 17, 1995, Ser. No. 36,327

Term of patent 14 years

U.S. Cl. D12—193



366,442

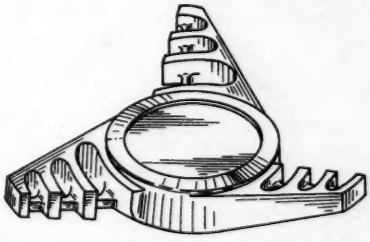
SPINNER FOR WHEELS

Raymond Marchisset, 12260 Marlowe, Tustin, Calif. 92680

Filed Jun. 16, 1994, Ser. No. 24,588

Term of patent 14 years

U.S. Cl. D12—213



366,443

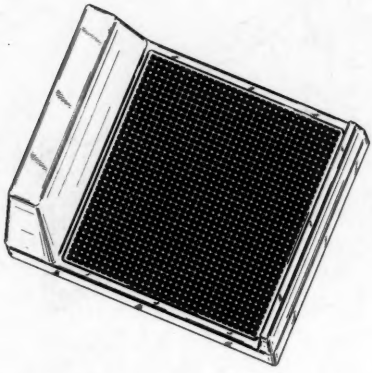
VEHICLE WHEEL STOP MAT

Gary M. Bach, Appleton, and James E. Buchman, Hortonville, both of Wis., assignors to Reynolds Consumer Products Inc., Appleton, Wis.

Filed Jan. 18, 1995, Ser. No. 33,662

Term of patent 14 years

U.S. Cl. D12—217



366,444

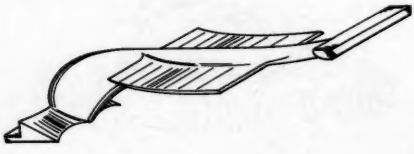
JET-PUMP WATERCRAFT INTAKE GRATE

Glendon L. Dilworth, 1215 E. 16th, Burley, Id. 83318, and Don R. Moyle, Rte. 1, Box 1762, Burley Burley, Id. 83318

Filed Oct. 13, 1994, Ser. No. 29,692

Term of patent 14 years

U.S. Cl. D12—317



366,445

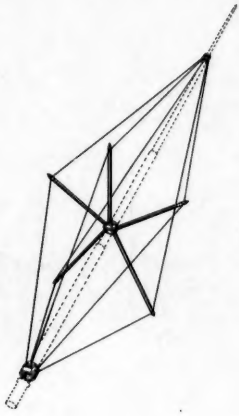
FISHING BOAT OUTRIGGER BRACE

Kurt V. Seggern, 2534 Arlington St., Sarasota, Fla. 34239

Filed Dec. 12, 1994, Ser. No. 32,031

Term of patent 14 years

U.S. Cl. D12—317



366,446

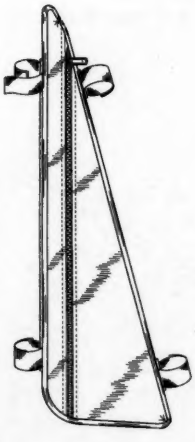
BICYCLE BAG

John A. Berman, San Anselmo, Calif., assignor to Dynacraft Industries Inc., Ashland, Mass.

Filed Oct. 25, 1994, Ser. No. 30,277

Term of patent 14 years

U.S. Cl. D12—409



366,447

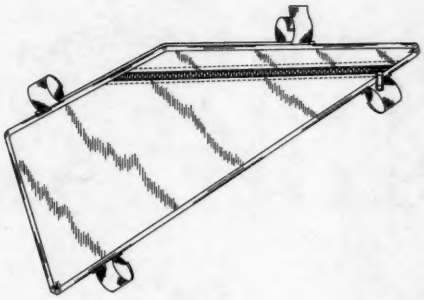
BICYCLE BAG

John A. Berman, San Anselmo, Calif., assignor to Dynacraft Industries Inc., Ashland, Mass.

Filed Oct. 25, 1994, Ser. No. 30,276

Term of patent 14 years

U.S. Cl. D12—409



366,448

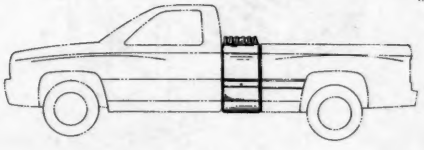
COVER FOR VEHICLE STORAGE COMPARTMENT

Clyde W. Ney, Waterford, and Phillip E. Payne, Northville, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 16, 1994, Ser. No. 18,868

Term of patent 14 years

U.S. Cl. D12—423



366,449

JEWELRY CHAIN

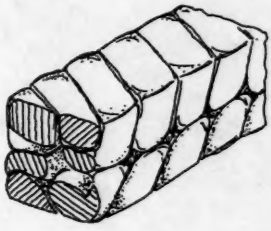
Luca Scortecci, and Marco Stocchi, both of Castiglion Fibocchi, Italy, assignors to S.I.L.O. S.p.A. Societa' Italiana Lavorazione Oro, Castiglion Fibocchi, Italy

Filed Oct. 7, 1994, Ser. No. 29,513

Claims priority, application Hague Agreement, May 2, 1994, DMA/002503

Term of patent 14 years

U.S. Cl. D11—6



366,450

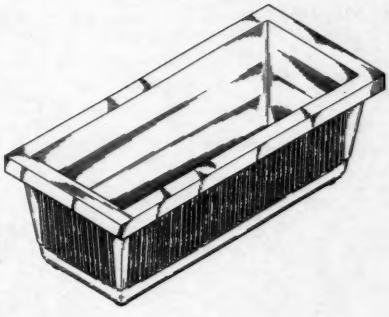
PLANTER

Sergio Rabito, Isola Vicentina, Italy, assignor to Euro 3 Plast Srl, Ponte di Barbarano VI, Italy

Filed Feb. 10, 1993, Ser. No. 4,648

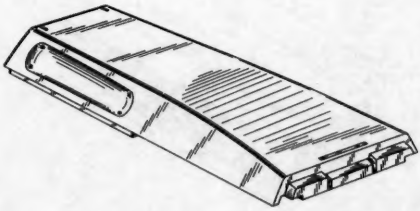
Term of patent 14 years

U.S. Cl. D11—155

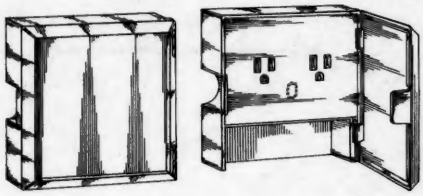


366,451
TWO-FACED OWL
Virgil L. Farstad, Douglas, N. Dak., assignor to Rice Lake Products, Inc., Minot, N. Dak.
Filed Sep. 8, 1994, Ser. No. 28,185
Term of patent 14 years
U.S. Cl. D11—162

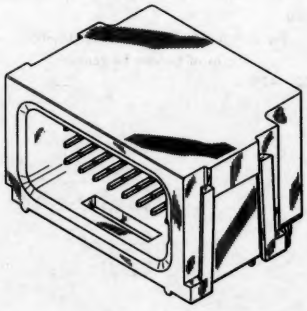
366,452
BATTERY
Richard Lindahl, Malmö , Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Division of Ser. No. 20,126, Mar. 18, 1994. This application Nov. 10, 1994, Ser. No. 31,186
Claims priority, application Sweden, Sep. 24, 1993, 932118
Term of patent 14 years
U.S. Cl. D13—103



366,453
ELECTRICAL OUTLET UNIT WITH COVER THAT HOLDS CERAMIC TILE OR DECORATIVE ELEMENT
George F. W. Boesel, Canton, Mass., and Mark W. Geis, Carmel, Ind., assignors to Woods Industries, Inc., Carmel, Ind.
Filed Feb. 15, 1995, Ser. No. 34,887
Term of patent 14 years
U.S. Cl. D13—139



366,454
PARALLEL MOUNTING HYBRID MODULAR ELECTRICAL SIGNAL CONNECTOR
Larry D. Eaton, Fremont, Calif., assignor to TVM, Inc., Fremont, Calif.
Filed Sep. 22, 1994, Ser. No. 29,411
Term of patent 14 years
U.S. Cl. D13—147



366,455

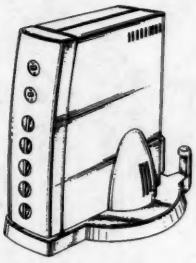
PORTABLE HUB

Dean Cheng, Hsin Chu, Taiwan, Prov. of China, assignor to D-Link Corporation, Hsin Chu, Taiwan, Prov. of China

Filed Nov. 9, 1994, Ser. No. 30,831

Term of patent 14 years

U.S. Cl. D13—147



366,456

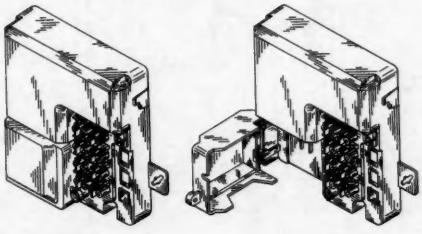
TELEPHONE NETWORK REMOTE TERMINAL HOUSING

Horace C. Rodriguez, Schaumburg; Leonardo D. Moral, Chicago; Walter T. Harwood, Streamwood, and Ronald M. Samson, Carol Stream, all of Ill., assignors to Charles Industries, Ltd., Rolling Meadows, Ill.

Filed Nov. 19, 1993, Ser. No. 15,556

Term of patent 14 years

U.S. Cl. D13—147



366,457

ELECTRIC FENCE CONTROLLER

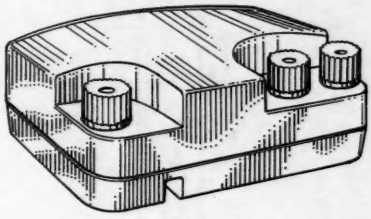
Murray N. Pilcher, Auckland, New Zealand, assignor to Stafix Electric Fencing Limited, Auckland, New Zealand

Filed Dec. 9, 1994, Ser. No. 32,278

Claims priority, application New Zealand, Sep. 23, 1994, 26204

Term of patent 14 years

U.S. Cl. D13—162



366,458

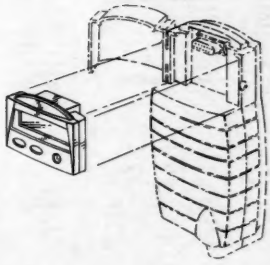
REMOVABLE PROGRAMMABLE CONTROL MODULE WITH DISPLAY FOR IRRIGATION CONTROL SYSTEM

Michael T. Pearson, West Molesey, and Kishen Gohil, New Malden, both of, United Kingdom, assignors to Imperial Underground Sprinkler Co., Lenexa, Kans.

Filed Sep. 1, 1994, Ser. No. 27,904

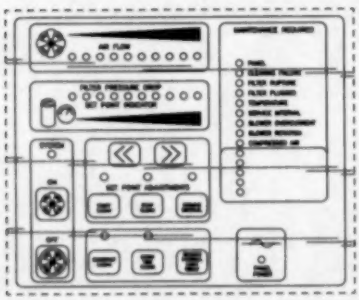
Term of patent 14 years

U.S. Cl. D13—162

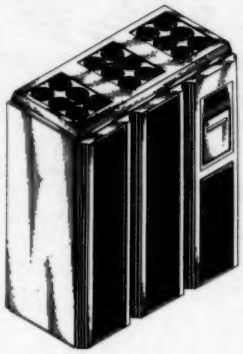


366,459
SERVOMOTOR DRIVE SETTING DEVICE
Junichi Kurokawa; Takeshi Majima; Katsuyoshi Nakano, and Hiromichi Kawashima, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan
Filed Jan. 5, 1995, Ser. No. 33,131
Claims priority, application Japan, Jul. 7, 1994, 6-20220
Term of patent 14 years
U.S. Cl. D13—164

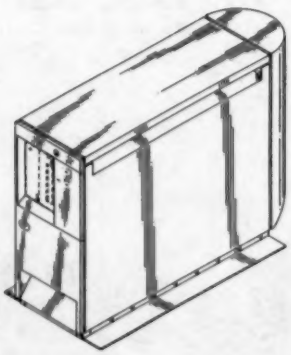
366,460
FRONT FACE OF A DISPLAY PANEL FOR A DUST COLLECTOR
Ronald L. Jorgenson, Apple Valley, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.
Filed Sep. 8, 1993, Ser. No. 12,672
Term of patent 14 years
U.S. Cl. D13—177



366,461
THREE-BAY ELECTRONICS CABINET
Lee Specht, Billerica, Mass., assignor to EMC Corporation, Hopkinton, Mass.
Filed Feb. 10, 1994, Ser. No. 18,726
Term of patent 14 years
U.S. Cl. D13—184



366,462
DATA PROCESSING SYSTEM
David W. Hill, and Tim K. Murphy, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 3, 1994, Ser. No. 22,257
Term of patent 14 years
U.S. Cl. D14—100



366,463

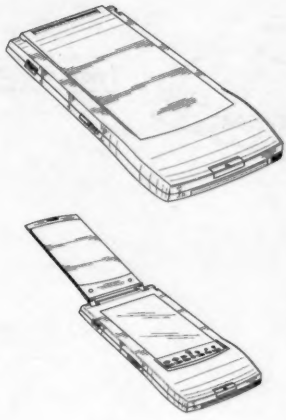
HANDHELD COMPUTER HOUSING

Jonathan P. Ive, San Francisco, and Ronald J. Moller, Boulder Creek, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 2, 1994, Ser. No. 19,471

Term of patent 14 years

U.S. Cl. D14—100



366,464

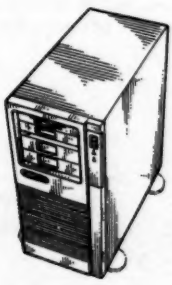
DATA PROCESSING EQUIPMENT UNIT

Randall W. Martin, The Woodlands, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Sep. 24, 1992, Ser. No. 951,550

Term of patent 14 years

U.S. Cl. D14—100



366,465

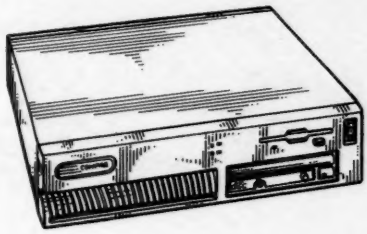
PERSONAL COMPUTER

Randall W. Martin, The Woodlands, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Sep. 9, 1993, Ser. No. 12,541

Term of patent 14 years

U.S. Cl. D14—100



366,466

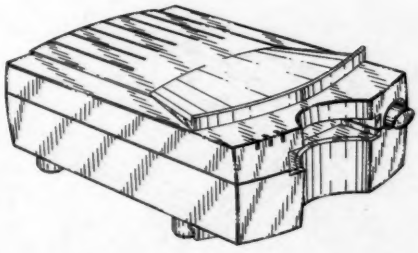
CARD READER

June Lee; William J. Evans, both of San Francisco, and Kevelyn K. Boyd, Berkeley, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 15, 1994, Ser. No. 32,317

Term of patent 14 years

U.S. Cl. D14—105



366,467

IMAGE SCANNER

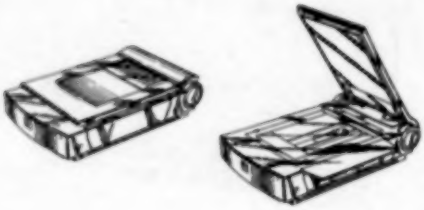
Ikuo Masujima, and Toshimitsu Ohara, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 5, 1994, Ser. No. 31,723

Claims priority, application Japan, Jun. 3, 1994, 6-16251

Term of patent 14 years

U.S. Cl. D14—107



366,468

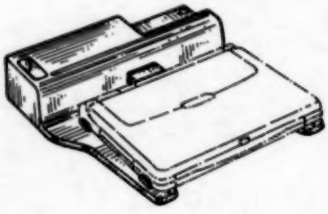
EXPANSION BASE FOR A NOTEBOOK PERSOANL COMPUTER

Sean P. Ryan, The Woodlands; Jeffrey L. Keaton, and Teodros Mesfin, both of Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jan. 27, 1994, Ser. No. 18,099

Term of patent 14 years

U.S. Cl. D14—107



366,469

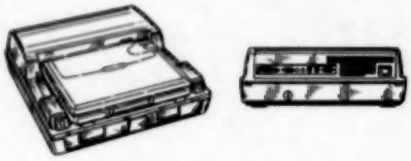
EXPANSION BASE FOR NOTEBOOK PERSONAL COMPUTER

John E. Youens, Tomball, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Dec. 30, 1993, Ser. No. 16,944

Term of patent 14 years

U.S. Cl. D14—107



366,470

EXPANSION PORT CONVERTER FOR NOTEBOOK PERSONAL COMPUTER

John E. Youens, Tomball, Tex., and Christopher M. Paddon, Santa Cruz, Calif., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Dec. 30, 1993, Ser. No. 16,941

Term of patent 14 years

U.S. Cl. D14—107

366,471

DISK DRIVE UNIT

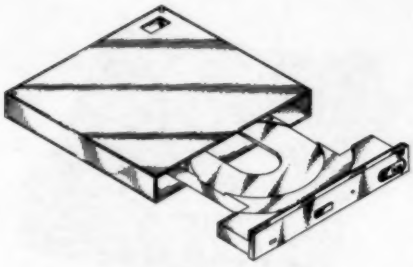
Masafumi Ito, and Shigeru Hasegawa, both of Musashino, Japan, assignors to TEAC Corporation, Japan

Filed Nov. 29, 1994, Ser. No. 31,505

Claims priority, application Japan, Jun. 22, 1994, 6-18442

Term of patent 14 years

U.S. Cl. D14—109



366,472

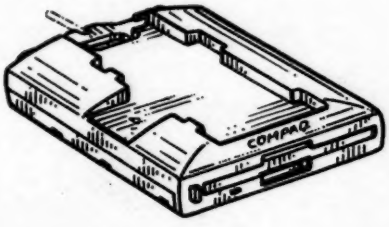
EXTERNAL FLOPPY DISK DRIVE FOR A NOTEBOOK PERSONAL COMPUTER

John E. Youens, Tomball, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jan. 27, 1994, Ser. No. 18,030

Term of patent 14 years

U.S. Cl. D14—109



366,473

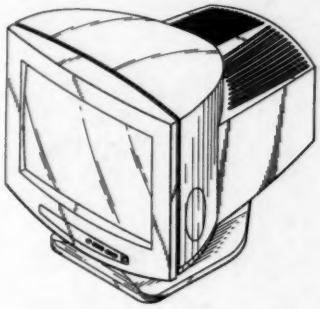
VIDEO DISPLAY TERMINAL

Yves A. Behar, San Francisco, Calif., assignor to Wyse Technology, Inc., San Jose, Calif.

Filed Oct. 5, 1994, Ser. No. 29,809

Term of patent 14 years

U.S. Cl. D14—113



366,474

MONITOR FOR COMPUTERS

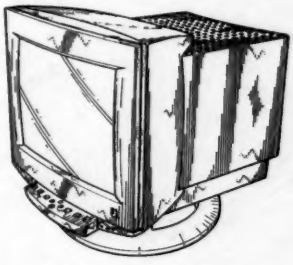
Jochen Backs, San Francisco, Calif., assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 7, 1994, Ser. No. 25,628

Claims priority, application Rep. of Korea, Mar. 18, 1994, 1994-5118

Term of patent 14 years

U.S. Cl. D14—113



366,475

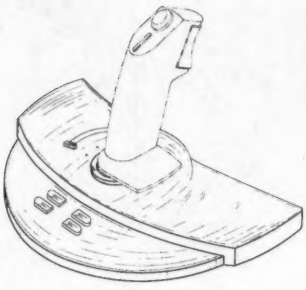
BASE FOR A COMPUTER JOYSTICK

Russell Sanchez; Mike Paull; Steve Kaneko, all of Seattle, Wash.; Henry Chin, Portland, Oreg.; Robert Dillon, Venice, Calif.; Michael Knodt, Columbus, Ohio, and Claire Beliard, Seattle, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Dec. 6, 1994, Ser. No. 31,810

Term of patent 14 years

U.S. Cl. D14—114



366,476

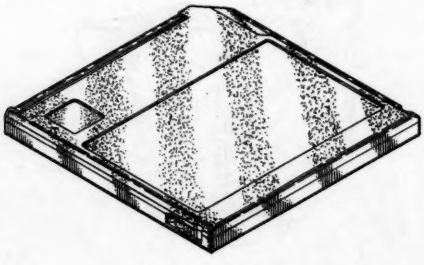
DISK CARTRIDGE

Jacques Bordes, Avranches, France, assignor to Nomai SA, Avranches Cedex, France

Filed Mar. 9, 1995, Ser. No. 36,019

Term of patent 14 years

U.S. Cl. D14—114



366,477

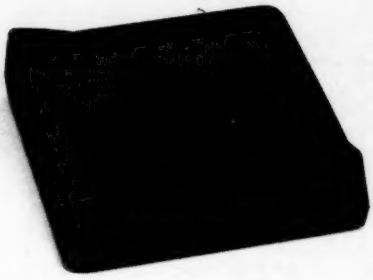
INFRARED ADAPTER FOR PRINTERS AND COMPUTERS

John W. Gassett; Jerry A. Thrasher, both of Lexington, and Stephen R. Wilson, Mt. Sterling, all of Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed Mar. 10, 1995, Ser. No. 36,045

Term of patent 14 years

U.S. Cl. D14—114



366,478

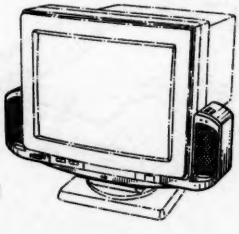
COMBINED MULTIMEDIA ATTACHMENT AND SPEAKERS FOR A COMPUTER MONITOR

George R. Daniels, Spring, Tex.; Thor R. Halseth, Simi Valley, and Daniel R. Vehse, Oxnard, both of Calif., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 23, 1994, Ser. No. 24,922

Term of patent 14 years

U.S. Cl. D14—114



366,479

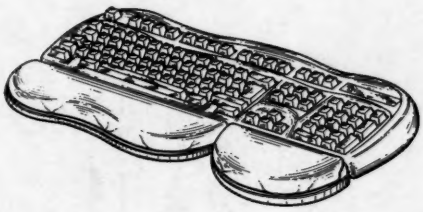
KEYBOARD

Theo Lievan, Wuerselen, Germany, assignor to Vobis Microcomputer AG, Wuerselen, Germany

Filed Sep. 9, 1994, Ser. No. 28,249

Term of patent 14 years

U.S. Cl. D14—115



366,480

FACSIMILE MODEM

Eiichi Shimizu, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 30, 1994, Ser. No. 32,914

Claims priority, application Japan, Jun. 30, 1994, 6-19505

Term of patent 14 years

U.S. Cl. D14—118

366,481

ELECTRONIC GAME VIEWING HEAD PIECE

Roni Raviv, Nes-Ziona, and Omri Rothschild, Tel Aviv, both of, Israel, assignors to Tiger Electronics, Inc., Vernon Hills, Ill.

Filed Jan. 13, 1995, Ser. No. 33,519

Term of patent 14 years

U.S. Cl. D14—124

366,482

AIRLINE TELEPHONE HANDSET WITH DIGITAL PASSENGER CONTROL FUNCTIONS AND VIDEO GAME CONTROLS

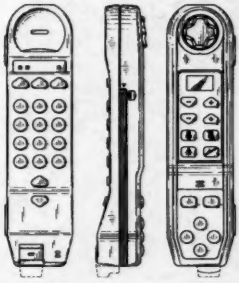
Richard A. Shields, Jr., Bellevue, Wash., assignor to Claircom Communications Group, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 21,670, Apr. 21, 1994. This application Apr. 25, 1994, Ser. No. 21,800

The portion of the term of this patent subsequent to Oct. 10, 2009, has been disclaimed.

Term of patent 14 years

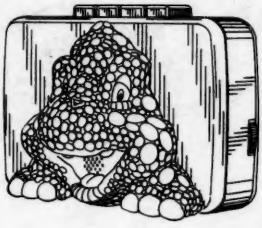
U.S. Cl. D14—146



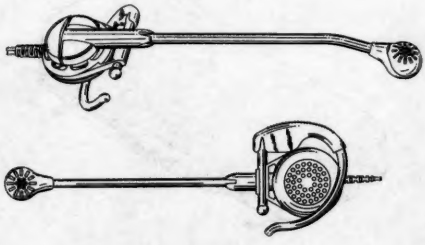
366,483
TELEPHONE SET
Ron Major, Cirencester, England, assignor to Video Technology Engineering, Ltd., Hong Kong, Hong Kong
Filed Sep. 3, 1993, Ser. No. 12,636
Claims priority, application United Kingdom, Mar. 8, 1993, 2029647
Term of patent 14 years
U.S. Cl. D14—149

366,484
TELEPHONE SET
Monte Levin, New York, N.Y., assignor to TT Systems Corporation, Yonkers, N.Y.
Filed Aug. 15, 1994, Ser. No. 27,169
Term of patent 14 years
U.S. Cl. D14—151

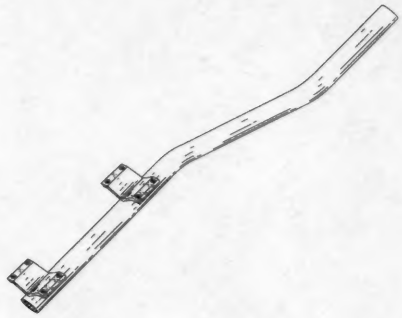
366,485
PORTABLE CASSETTE PLAYER
Mark Grasso, 19846 Pacific Coast Hwy., #2, Malibu, Calif. 90265; John Hamagami, Los Angeles, and Justin Carroll, Venice, both of Calif., assignors to Mark Grasso, Malibu, Calif.
Filed Dec. 30, 1993, Ser. No. 16,962
Term of patent 14 years
U.S. Cl. D14—165



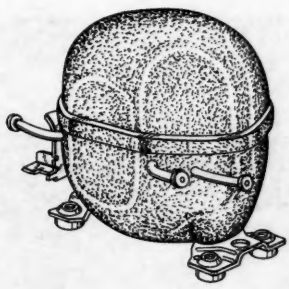
366,486
HEADSET
Lars Runquist, St. Paul, and David J. Copeland, Minneapolis, both of Minn., assignors to Telex Communications, Inc., Minneapolis, Minn.
Filed Oct. 11, 1994, Ser. No. 29,556
Term of patent 14 years
U.S. Cl. D14—206



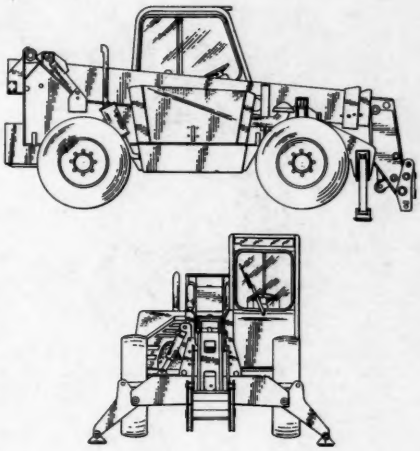
366,487
AUXILIARY ANTENNA MOUNT
John H. Jones, 1615 Brices Creek Rd., New Bern, N.C. 28562
Filed Mar. 29, 1994, Ser. No. 20,584
Term of patent 14 years
U.S. Cl. D14—238



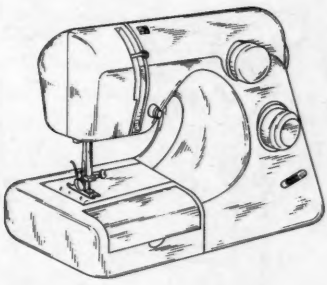
366,488
REFRIGERANT MOTOR COMPRESSOR
Biagio Alfano, Milan, and Edoardo Biscaldi, Saronno, both of, Italy, assignors to Necchi Compressori S.r.l., Pavia, Italy
Filed Sep. 23, 1994, Ser. No. 28,860
Claims priority, application Italy, Mar. 28, 1994, PV 94 0000002
Term of patent 14 years
U.S. Cl. D15—9



366,489
TELESCOPIC MATERIAL HANDLING VEHICLE
David J. Brown, Nr Thirst, England, assignor to Caterpillar Inc., Peoria, Ill.
Filed Apr. 19, 1994, Ser. No. 21,480
Term of patent 14 years
U.S. Cl. D15—22



366,490
SEWING MACHINE
Chao-Jung Wu, No. 36, 135 Lane, Jyh-Shan Rd., Da-Li city, Taichung Hsien, Taiwan, Prov. of China
Filed Apr. 20, 1994, Ser. No. 21,534
Term of patent 14 years
U.S. Cl. D15—69



366,491

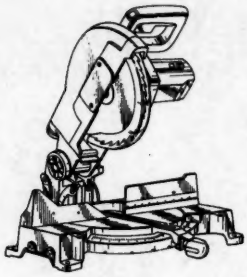
ELECTRIC SAW

Chiu-Tsun Chang, Taichung, Taiwan, Prov. of China, assignor to P & F Brother Indutrial Corporation, Taichung, Taiwan, Prov. of China

Filed Mar. 13, 1995, Ser. No. 36,093

Term of patent 14 years

U.S. Cl. D15—133



366,492

COMBINED MONITOR, VIDEO TAPE RECORDER AND CAMERA

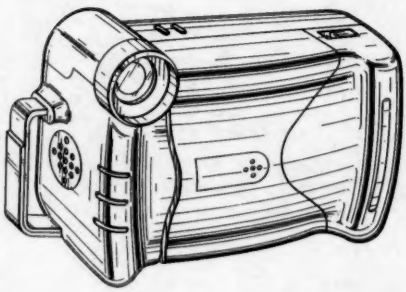
Katsunori Kume, and Yasushi Fukuda, both of Tochigi, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 5, 1994, Ser. No. 22,450

Claims priority, application Japan, Nov. 18, 1993, 5-35220

Term of patent 14 years

U.S. Cl. D16—202



366,493

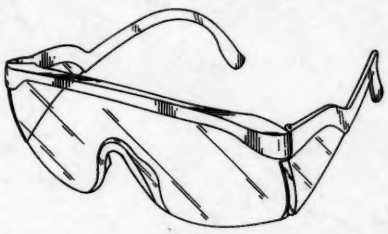
EYEWEAR

Guy Magdelaine, Vaux les Saint Claude, and Bernard Reymondet, Saint Claude, both of, France, assignors to WGM Safety Corp., Reading, Pa.

Filed Oct. 29, 1993, Ser. No. 14,700

Term of patent 14 years

U.S. Cl. D16—314



366,494

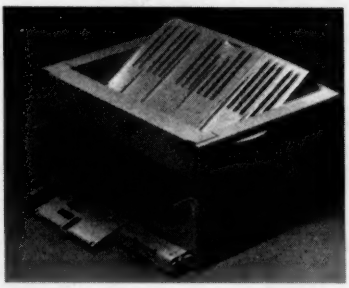
DUPLEX ATTACHMENT FOR A PRINTER

David C. Bishop, Lexington, Ky., assignor to Lexmark International, Inc., Greenwich, Conn.

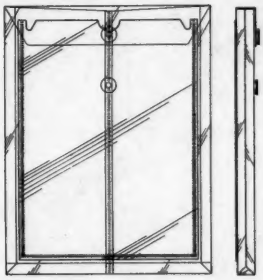
Filed Sep. 2, 1994, Ser. No. 28,031

Term of patent 14 years

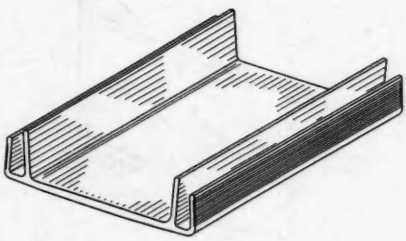
U.S. Cl. D18—49



366,495
ENVELOPE
Masafumi Hirai, Torrance, Calif., assignor to Lion Office Products, Inc., Gardena, Calif.
Filed Oct. 24, 1994, Ser. No. 30,100
Term of patent 14 years
U.S. Cl. D19—3



366,496
RING BINDER STABILIZER
Felix H. Yiu, 17234 Bullock St., Encino, Calif. 91316
Filed Dec. 29, 1994, Ser. No. 32,810
Term of patent 14 years
U.S. Cl. D19—32



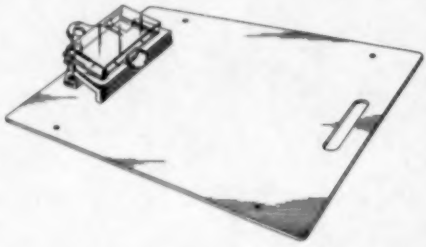
366,497
WRITING INSTRUMENT
Yasuo Otake, Los Angeles, Calif., assignor to Pentel of America, Ltd., Japan
Filed May 19, 1994, Ser. No. 23,209
Term of patent 14 years
U.S. Cl. D19—51

366,498
BALL POINT PEN
Shinichi Abe, and Teruya Yazawa, both of Tokyo, Japan, assignors to Zebra Co., Ltd., Tokyo, Japan
Filed Feb. 16, 1995, Ser. No. 34,977
Claims priority, application Japan, Aug. 19, 1994, 6-25040
Term of patent 14 years
U.S. Cl. D19—51

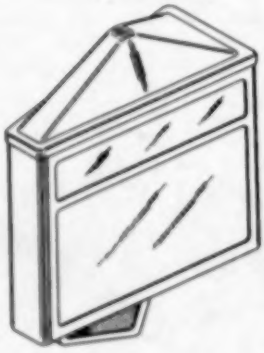
366,499
HOUSING FOR AN ELECTRONIC EDUCATIONAL GAME
Kwok K. Fung, Chai Wan, Hong Kong, assignor to VTech Industries, Inc., Wheeling, Ill.
Filed Jun. 2, 1994, Ser. No. 23,886
Claims priority, application United Kingdom, Dec. 6, 1993, 2035697
Term of patent 14 years
U.S. Cl. D19—60

366,500
DESK CADDY FOR ASSORTED OFFICE ARTICLES
Stephen a. Goldthwaite, 14 Lanz La., Ellington, Conn.
Filed Jul. 25, 1994, Ser. No. 26,262
Term of patent 14 years
U.S. Cl. D19—82

366,501
CLIPBOARD
Ellis N. Shamoon, 2833 Park Bridge Ct., Dallas, Tex. 75219
Filed Feb. 10, 1995, Ser. No. 34,732
Term of patent 14 years
U.S. Cl. D19—88



366,502
COMBINED MENU AND SPEAKER HOUSING FOR A DRIVE-IN RESTAURANT
Andrew Durco, Jr., P.O. Box 850223, Mesquite, Tex. 75185
Filed Jul. 30, 1993, Ser. No. 10,291
Term of patent 14 years
U.S. Cl. D20—19



366,503

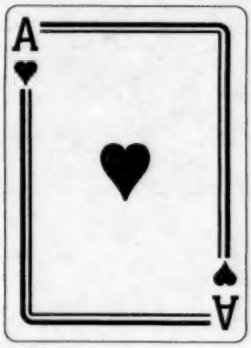
BLACKJACK CARD DECK

Randy D. Sines, Spokane, Wash.; Steven L. Forte, Henderson, Nev., and David A. Krise, Spokane, Wash., assignors to Sines & Forte, Henderson, Nev.

Filed Sep. 23, 1994, Ser. No. 28,882

Term of patent 14 years

U.S. Cl. D21—45



366,504

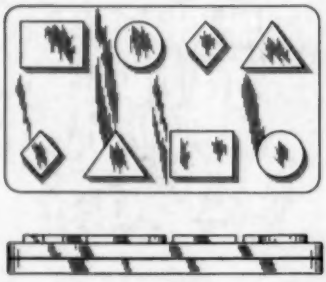
ACTIVITY TOY

Gustave E. Bannick, 6546 Elkrun Ct., Clarkston, Mich. 48348-2812

Filed Feb. 16, 1994, Ser. No. 18,841

Term of patent 14 years

U.S. Cl. D21—59



366,505

BALANCING TOY

Howard L. Dowdy, and Edna D. Dowdy, both of P.O. Box 4123, Ione, Calif. 95640-4123

Filed Feb. 16, 1995, Ser. No. 34,978

Term of patent 14 years

U.S. Cl. D21—102

366,506

GAME

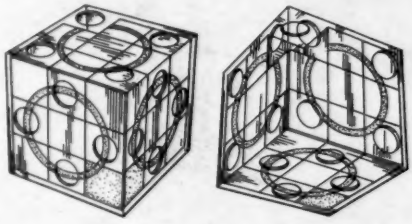
Johan Lindquist, Björkforsvägen 32, S-950 55 Sangis, Sweden

Filed Mar. 2, 1995, Ser. No. 35,574

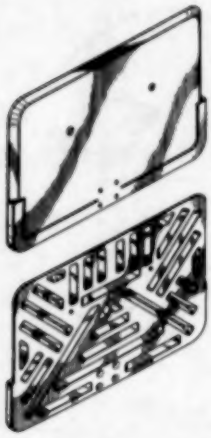
Claims priority, application Sweden, Sep. 6, 1994, 94-1782

Term of patent 14 years

U.S. Cl. D21—104

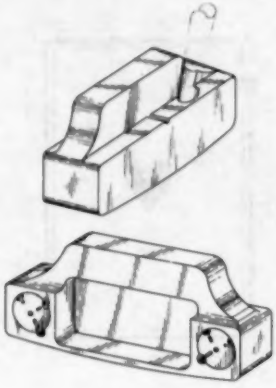


366,507
BASKETBALL BACKBOARD
Edward G. van Nimwegen, North Ogden, and Kelly Taylor, Layton, both of Utah, assignors to Lifetime Products, Inc., Clearfield, Utah
Filed Jan. 30, 1995, Ser. No. 34,213
Term of patent 14 years
U.S. Cl. D21—201



366,508
WOOD-TYPE GOLF CLUB HEAD
Patrice Hutin, Los Angeles, Calif., assignor to Roger Cleveland Golf Company, Inc., Cypress, Calif.
Filed Apr. 13, 1994, Ser. No. 21,252
Term of patent 14 years
U.S. Cl. D21—214

366,509
GOLF PUTTER HEAD
Edward Chiuminatta, and Alan R. Chiuminatta, both of 1112 Olympic Dr., Corona, Calif. 91718
Filed Mar. 3, 1994, Ser. No. 19,592
Term of patent 14 years
U.S. Cl. D21—219



366,510
BOWLING PIN STORAGE BIN FOR A PIN DELIVERY MECHANISM
Michael W. Stephens, Richmond, Va., assignor to AMF Bowling, Inc., Mechanicsville, Va.
Filed Jan. 30, 1995, Ser. No. 34,199
Term of patent 14 years
U.S. Cl. D21—233

366,511

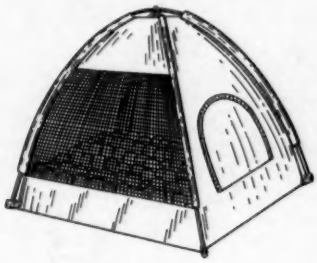
CHILDREN'S PLAY BALL ENCLOSURE

Russell J. Coddington, Jr., Imperial, Pa., assignor to Hedstrom Corporation, Bedford, Pa.

Filed Oct. 6, 1994, Ser. No. 28,624

Term of patent 14 years

U.S. Cl. D21—240



366,512

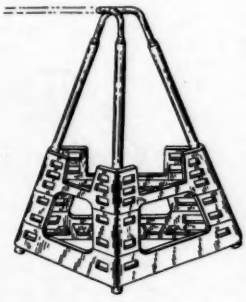
PYRAMID-TYPE SWING SUPPORT

William H. Ziegler, Jr.; Robert J. Boudreau, both of Bedford, and Russell J. Coddington, Jr., Imperial, all of Pa., assignors to Bedstrom Corporation, Bedford, Pa.

Filed Dec. 12, 1994, Ser. No. 32,648

Term of patent 14 years

U.S. Cl. D21—246



366,513

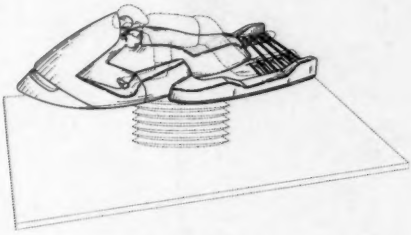
CONSOLE FOR PROVIDING VIRTUAL REALITY ENVIRONMENTS

Bernard J. Crowe; Scott J. Bennett, both of San Diego; Bernard L. Brown, La Mesa; Robert W. Bockstahler, Encinitas; William S. Buchwald, Alpine; John J. Volanski, San Diego; John A. Cupit, Del Mar, and Larry E. Brinker, Ramona, all of Calif., assignors to Greystone Technology, Inc., San Diego, Calif.

Filed Oct. 28, 1994, Ser. No. 30,428

Term of patent 14 years

U.S. Cl. D21—250



366,514

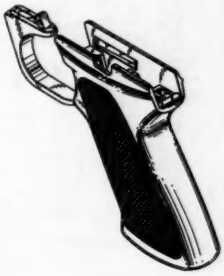
COMBINED HANDGRIP AND TRIGGER GUARD FOR A FIREARM

Paul M. Hochstrate, Plantsville, and Michael E. Gamache, Tolland, both of Conn., assignors to Colt's Manufacturing Company Inc., West Hartford, Conn.

Filed Dec. 9, 1994, Ser. No. 31,960

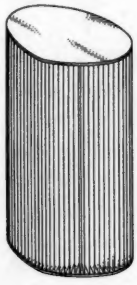
Term of patent 14 years

U.S. Cl. D22—108

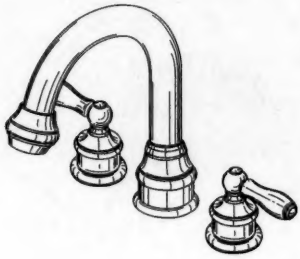


366,515
FIGHTER KNIFE
Lynn C. Thompson, 2747 Seahorse, Ventura, Calif. 93001
Filed Nov. 1, 1994, Ser. No. 30,534
Term of patent 14 years
U.S. Cl. D22—118

366,516
FILTER ELEMENT
Howard M. Stewart, Little Rock, Ark., assignor to Jacuzzi Inc., Little Rock, Ark.
Filed Jun. 7, 1994, Ser. No. 24,059
Term of patent 14 years
U.S. Cl. D23—209



366,517
FAUCET
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart, Inc., Newark, Del.
Filed Jan. 25, 1995, Ser. No. 33,977
Term of patent 14 years
U.S. Cl. D23—242



366,518
FAUCET HANDLE
In-Ho Moon, Seoul, Rep. of Korea, assignor to American Standard Inc., Piscataway, N.J.
Continuation of Ser. No. 18,875, Feb. 17, 1994, abandoned.
This application Mar. 20, 1995, Ser. No. 36,415
Claims priority, application Rep. of Korea, Aug. 18, 1993, 1993-16697
Term of patent 14 years
U.S. Cl. D23—252

366,519

FAUCET HANDLE

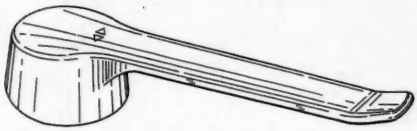
Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany

Filed Mar. 29, 1995, Ser. No. 36,879

Claims priority, application Germany, Jan. 31, 1994, 94 08 477.7

Term of patent 14 years

U.S. Cl. D23—252



366,520

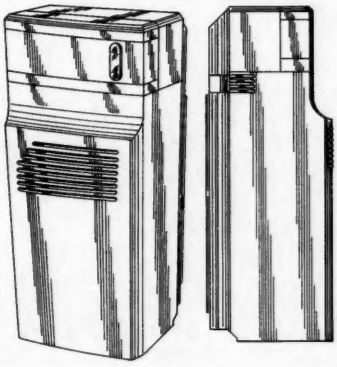
DRIP DISPENSER FOR FRAGRANCE AND ANTI-BACTERIAL FLUIDS

Kenneth J. Muderlak, Shorewood, Wis., assignor to Technical Concepts L.P., Elk Grove Village, Ill.

Filed Oct. 4, 1993, Ser. No. 13,655

Term of patent 14 years

U.S. Cl. D23—366



366,521

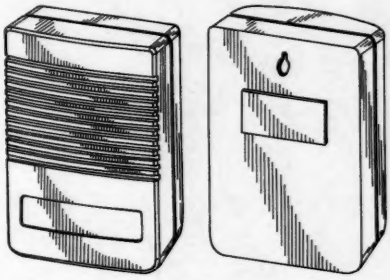
CONTAINER FOR ODOR ADSORBING MATERIALS

Nancy G. Wijaranakula, Clark, Wash., assignor to Infotix Systems, Incorporated, Vancouver, Wash.

Filed Nov. 14, 1994, Ser. No. 30,981

Term of patent 14 years

U.S. Cl. D23—366



366,522

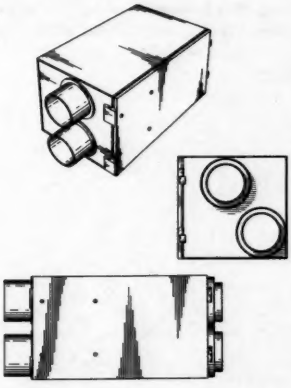
VENTILATOR HOUSING

Frederic Lagace; Jean-Francois Grondin, both of Drummondville; Pierre Cusson, St-Germain de Grantham; Michel Julien, St-Nicéphore, and Daniel Marcoux, Drummondville, all of, Canada, assignors to Venmar Ventilation Inc., Drummondville, Canada

Filed Jan. 13, 1995, Ser. No. 33,443

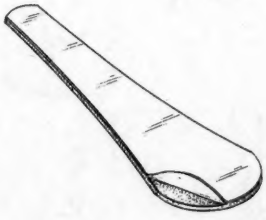
Term of patent 14 years

U.S. Cl. D23—370

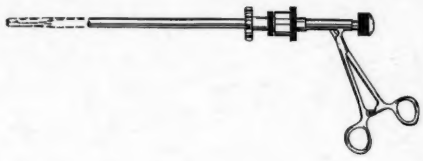


366,523
FAN
Roderick L. Eyer, 2 Wallingford Dr., Melville, N.Y. 11747
Filed Apr. 3, 1995, Ser. No. 37,079
Term of patent 14 years
U.S. Cl. D23—378

366,524
THONG PANTY LINER
Pamela S. Chung, 1071 Autumn Wood La., Perris, Calif. 92571
Filed May 31, 1994, Ser. No. 23,727
Term of patent 14 years
U.S. Cl. D24—125



366,525
HANDLE FOR AN ENDOSCOPIC SURGICAL INSTRUMENT
Frederick K. Toy, 565 N. Hall St.; Roy T. Smoot, Jr., Rte. 4, Box 239, and Robert H. LaPrad, Rte. 1 - Box 337 B W, all of Seaford, Del. 19973
Filed Dec. 2, 1993, Ser. No. 15,947
Term of patent 14 years
U.S. Cl. D24—143



366,526
NASAL PROSTHESIS
Marco Rizzo, 1329 Lusitana St., Ste. 401, Honolulu, Hi. 96813
Filed Mar. 31, 1994, Ser. No. 20,744
Term of patent 14 years
U.S. Cl. D24—155

366,527

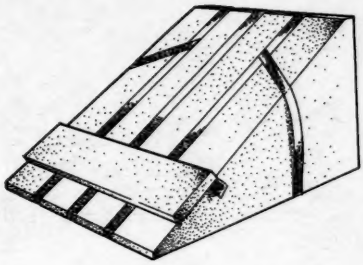
X-RAY ACCESSORY SUPPORT WEDGE

Virginia Paterson, 287 Brock St., Winnipeg, Manitoba, Canada

Filed May 22, 1992, Ser. No. 886,481

Term of patent 14 years

U.S. Cl. D24—158



366,528

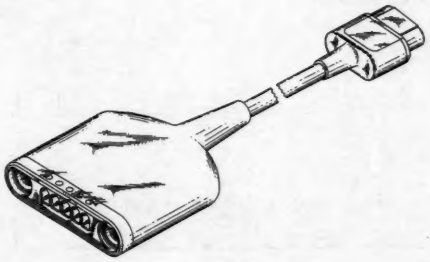
POD WITH CABLE FOR COUPLING A PLURALITY OF SENSORS TO A PATIENT MONITOR

Helen C. Crouse, Waltham, Mass., and Sheldon G. Phillips, Pasadena, Calif., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Jun. 3, 1994, Ser. No. 23,917

Term of patent 14 years

U.S. Cl. D24—187



366,529

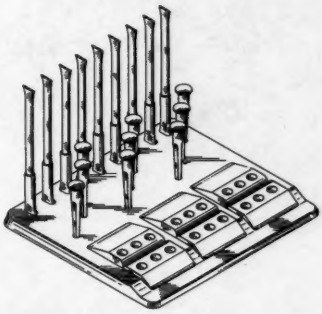
IMMUNOASSAY KIT FOR ANALYSIS OF BIOLOGICAL LIQUIDS

Kerinchan P. J. Babaoglu; Norbert S. Norkus, both of Webster, and Randall S. Johnson, Fairport, all of N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 681,588, Apr. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 604,285, Oct. 29, 1990, abandoned. This application Jan. 21, 1992, Ser. No. 823,224

Term of patent 14 years

U.S. Cl. D24—223



366,530

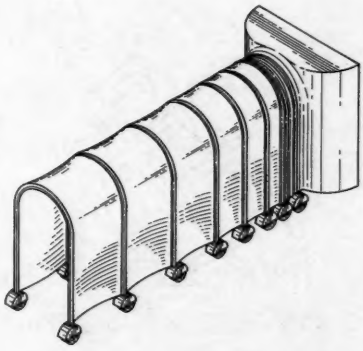
COMBINED PORTABLE AND RETRACTABLE TUNNEL

John Spitz, 6335 Cronin, Dearborn Heights, Mich. 48127, and James Maceroni, 984 McDonald, Northville, Mich. 48167

Filed Oct. 21, 1994, Ser. No. 30,168

Term of patent 14 years

U.S. Cl. D25—18



366,531

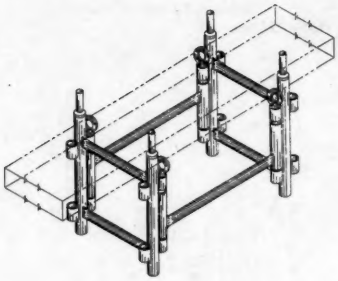
FOLDABLE SCAFFOLD

Donald Wedge, Rte. 1, Box 558C, Myakka City, Fla. 34251

Filed Feb. 7, 1994, Ser. No. 18,459

Term of patent 14 years

U.S. Cl. D25—66



366,532

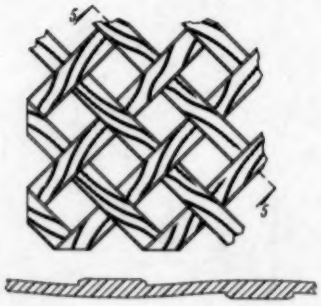
LATTICE

Walter B. Herbst, Evanston, and James F. Caruso, Chicago, both of Ill., assignors to Fort Wayne Plastics, Inc., Fort Wayne, Ind.

Filed Mar. 26, 1993, Ser. No. 6,355

Term of patent 14 years

U.S. Cl. D25—100



366,533

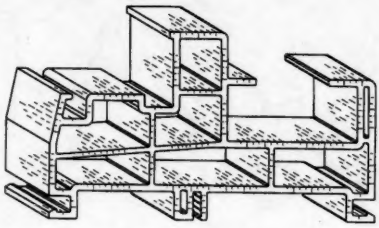
WINDOW COMPONENT EXTRUSION

Jeffrey R. Franson, Kent, Wash., assignor to Mikron Industries, Kent, Wash.

Filed May 31, 1995, Ser. No. 39,582

Term of patent 14 years

U.S. Cl. D25—124



366,534

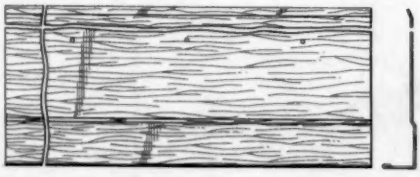
PRE-FORMED FASCIA

Danny L. McMahon, Acworth, Ga., assignor to Caldamc, Inc., Acworth, Ga.

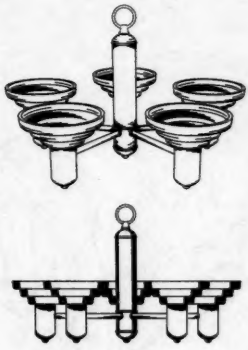
Filed Aug. 4, 1994, Ser. No. 26,722

Term of patent 14 years

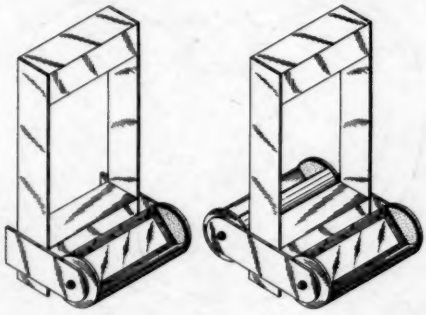
U.S. Cl. D25—139



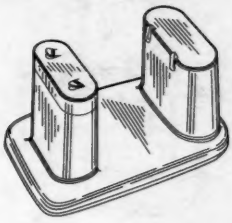
366,535
CHANDELIER
Patrick S. Dolan, 1901 NW. Upshur St., Portland, Oreg. 97209
Filed Jan. 4, 1995, Ser. No. 33,066
Term of patent 14 years
U.S. Cl. D26—86



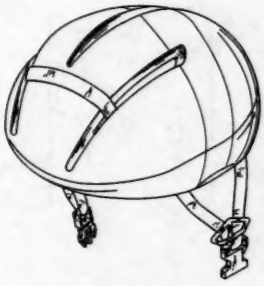
366,536
LUMINAIRE
Sylvan R. Shemitz, Woodbridge, Conn., assignor to Sylvan R. Shemitz Associates, Inc., West Haven, Conn.
Filed Sep. 29, 1994, Ser. No. 29,086
Term of patent 14 years
U.S. Cl. D26—88



366,537
FLOSS DISPENSER
James B. Johnsen; Hal J. Oien, both of Beaverton, Oreg., and Delbert L. Rice, Vancouver, Wash., assignors to Jordco, Inc., Beaverton, Oreg.
Filed Mar. 27, 1995, Ser. No. 36,751
Term of patent 14 years
U.S. Cl. D28—64



366,538
SAFETY HELMET
Chang-Hsien Ho, 12F., No. 16, Sec. 1, Ho-Ping F. Road, Taipei, Taiwan, Prov. of China
Filed Sep. 24, 1993, Ser. No. 13,421
Term of patent 14 years
U.S. Cl. D29—102



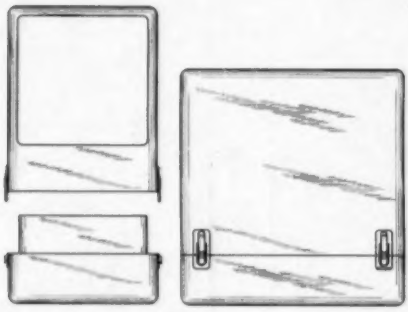
366,539
COMBINED CAP AND FACE MASK
Milan S. Lackovic, 424 Patrick Ct., Port Washington, Wis. 53074
Filed Dec. 30, 1994, Ser. No. 32,862
Term of patent 14 years
U.S. Cl. D29—106

366,540
WELDING MASK
Gordon Elias, Box 1304 North Battleford, Saskatchewan, Canada
Filed Jan. 9, 1995, Ser. No. 33,271
Claims priority, application Canada, Jul. 7, 1994, 1994-1281
Term of patent 14 years
U.S. Cl. D29—110

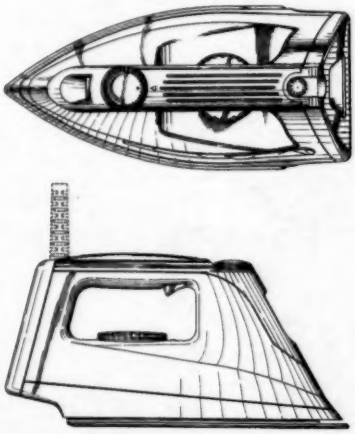
366,541
DOGHOUSE
Thomas A. Bradburn; Richard K. Garton, and Richard N. Sauerwein, all of Fort Wayne, Ind., assignors to Fort Wayne Plastics, Inc., Fort Wayne, Ind.
Filed Dec. 12, 1994, Ser. No. 32,008
Term of patent 14 years
U.S. Cl. D30—112

366,542
ANIMAL COLLAR
Zehra L. Pierson, 3010B Yorktown St., El Centro, Calif. 92243
Filed Jun. 6, 1994, Ser. No. 24,038
Term of patent 14 years
U.S. Cl. D30—152

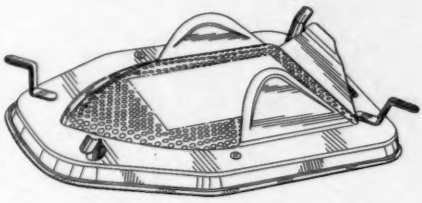
366,543
CAT LITTER BOX
Rosemary G. Lopes, 230 S. Walker St., Tauton, Mass. 02780
Filed Jul. 18, 1994, Ser. No. 26,047
Term of patent 14 years
U.S. Cl. D30—161



366,544
IRON
L. Wai Choi, 68 Jumbo Court, 45 Broadcast Drive, Kowloon, Hong Kong
Filed Nov. 30, 1994, Ser. No. 31,524
Term of patent 14 years
U.S. Cl. D32—70

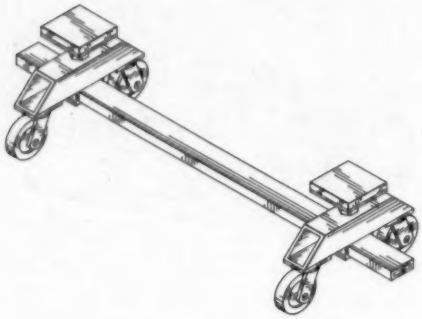


366,545
IRON STAND
Narendran Sambamurti, 260 Seneca Hill Dr., #1803, Willowdale, Ontario M2J 4S6, Canada
Filed Dec. 5, 1994, Ser. No. 32,075
Term of patent 14 years
U.S. Cl. D32—73

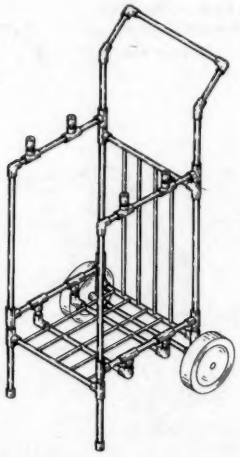


366,546
SHOPPING STROLLER/CART
Vaughan Schaub, Big Lake; Paul Schlough, Anoka; Carl R. VanHorn, Rogers; Jay R. Stemler, Owatonna, and Gary R. Ebling, Northfield, all of Minn., assignors to Dayton Hudson Corporation, Minneapolis, Minn.
Filed Feb. 17, 1995, Ser. No. 35,057
Term of patent 14 years
U.S. Cl. D34—20

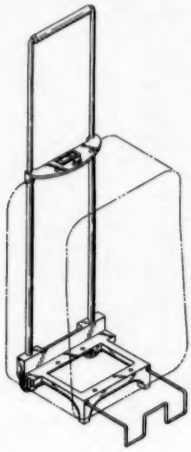
366,547
UNI-DOLLY
Russ Arn, P.O. Box 3013, Vancouver, Wash. 98668
Filed Oct. 5, 1994, Ser. No. 29,416
Term of patent 14 years
U.S. Cl. D34—23



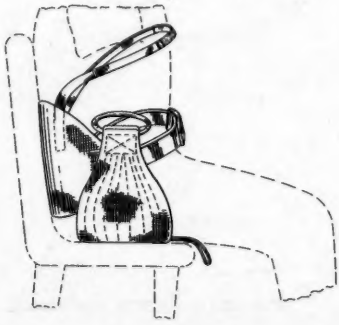
366,548
PET WASTE DISPOSAL HANDCART
Linda M. Morasse, 225 Pembroke Hill Rd., Suncook, N.H. 03275
Filed Oct. 21, 1994, Ser. No. 30,171
Term of patent 14 years
U.S. Cl. D34—24



366,549
LUGGAGE CART
Chris Yu, 2667 Clarellen St., Torrance, Calif. 90505
Filed Jul. 22, 1994, Ser. No. 26,854
Term of patent 14 years
U.S. Cl. D34—26



366,550
LIFTING AID
Leo Shapiro, 1175 York Ave., Apt. 18c, New York, N.Y. 10021
Filed Oct. 17, 1994, Ser. No. 29,835
Term of patent 14 years
U.S. Cl. D34—28



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PATENTS WERE ISSUED ON THE 23rd DAY OF JANUARY, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aab, Volker: *See—*
Seiler, Hartmut; Haderer, Guenter; Aab, Volker; and Peter, Cornelius, 5,486,759, Cl. 324-207.200.

Aarhus, Robert A.: *See—*
Walseth, Timothy F.; Lee, Hon-Cheung; and Aarhus, Robert A., 5,486,604, Cl. 536-26.130.

Aavid Laboratories, Inc.: *See—*
Larson, Ralph I.; and Phillips, Richard L., 5,485,671, Cl. 29-840.032.

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Brophy, Mark E., 5,485,877, Cl. 165-8.000.

ABB Environmental Systems, Div. of ABB Flakt, Inc.: *See—*
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ABB Power T&D Company Inc.: *See—*
Linsenbardt, Thomas L.; and Hickman, Daniel H., 5,485,945, Cl. 226-10.000.

Abbott Laboratories: *See—*
Summers, James B., Jr.; Davidsen, Steven K.; Curtin, Michael L.; Heyman, H. Robin; Sheppard, George S.; Xu, Lianhong; Carrera, George M., Jr.; and Garland, Robert B., 5,486,525, Cl. 514-303.000.

Abbott, Thomas A.; Cooley, Stephen E.; and MacDonald, Michael S., to Venturedyne, Ltd. Variable air volume terminal unit with exterior insulation. 5,486,140, Cl. 454-333.000.

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Cobelo, Vincent, 5,486,030, Cl. 294-113.000.

Abdellah, Latifa: *See—*
Boutevin, Bernard J. L.; Abdellah, Latifa; and Caporiccio, Gerardo, 5,486,422, Cl. 428-447.000.

Abe, Hiroya: *See—*
Iwasawa, Kenjiroh; and Abe, Hiroya, 5,487,003, Cl. 364-424.100.

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Ishitaka, Yoshihiko; Sato, Yumiko; Abe, Munemitsu; Sasaki, Yorihiko; Kano, Mitsuru; Sato, Arao; and Sugawara, Kiyomi, 5,486,403, Cl. 428-167.000.

Abe, Takashi: *See—*
Fukaya, Haruhiko; Abe, Takashi; Hayashi, Eiji; Hayakawa, Yoshio; and Baba, Hajime, 5,486,275, Cl. 204-157.600.

Abe, Yoshiaki: *See—*
Matsushita, Osami; Yoneyama, Mitsuho; Takahashi, Naohiko; Fukushima, Yasuo; Hiroshima, Minoru; Kaneki, Tadashi; Abe, Yoshiaki; and Sakanashi, Naofumi, 5,486,729, Cl. 310-90.500.

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Maischner, Dora; Drenker, Alexander J.; Abels, Peter; and Beyer, Eckhard, 5,486,677, Cl. 219-121.830.

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Kasahara, Keiji, 5,486,974, Cl. 361-234.000.

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Failli, Amedeo A.; Bleyman, Oleg I.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,486,522, Cl. 514-291.000.
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Adovasio, Mauro: *See—*
Broussard, Fabio; Adovasio, Mauro; Callierotti, Corrado; Taroni, Gianbattista; and Roncalli, José, 5,486,613, Cl. 546-181.000.

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Advanced Parts Technology, Inc.: *See—*
Martin, Dennis C.; and Reeb, Mark A., 5,486,079, Cl. 411-392.000.

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Atkins, Richard S.; Gibson, Tommy W.; and Ransome, Philip P., 5,487,108, Cl. 379-355.000.

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Kowalczyk, Thomas M.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kulak, Richard E.; and Barrett, David W., 5,485,896, Cl. 187-330.000.

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Aida, Satoshi; Shibata, Mariko; Fujimoto, Katsuhiko; Ishibashi, Yoshiharu; Suzuki, Takuji; Sato, Kozo; and Itoh, Ayao, to Kabushiki Kaisha Toshiba. Method and apparatus for ultrasonic wave medical treatment using computed tomography. 5,485,839, Cl. 128-653.100.

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Asahara, Norimi; Fukumura, Kagenori; Hojo, Yasuo; and Ozaki, Kazuhisa, 5,486,146, Cl. 477-65.000.

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Ito, Sadao; and Nawa, Hiroshi, 5,486,036, Cl. 297-339.000.

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Hiratsuka, Yutaka; and Akiyama, Tadashi, 5,485,861, Cl. 134-182.000.

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Dahlberg, Sven G. B., 5,485,817, Cl. 123-198.00E.

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Bouic, Patrick J. D.; and Albrecht, Carl F. De Vosa, 5,486,510, Cl. 514-170.000.

Albrecht, Loren C.: *See*—
Bemis, Peter F.; Albrecht, Loren C.; and Schick, Steven F., 5,486,327, Cl. 264-211.210.

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Ayers, Gregory M.; Alferness, Clifton A.; and White, Harley G., 5,486,198, Cl. 607-5.000.

Alker, David; and Cross, Peter E., to Pfizer Inc. Anticholinergic agents. 5,486,527, Cl. 514-321.000.

Allan, Kenneth: *See*—
Cruden, Andrew J.; McDonald, James R.; Andonovic, Ivan; Allan, Kenneth; and Porrelli, Raymond A., 5,486,754, Cl. 324-96.000.

Allen, Donald E. Continuous touch keyboard. 5,486,058, Cl. 400-485.000.

Allergan, Inc.: *See*—
Andrews, Steven W., 5,486,540, Cl. 514-530.000.

Alliance Winding Equipment, Inc.: *See*—
Bouman, David G.; Moser, Larry D.; and Moser, Keith W., 5,485,670, Cl. 29-732.000.

AlliedSignal Inc.: *See*—
Berwanger, Fred W., 5,485,902, Cl. 188-196.00A.
Leung, Roger Y., 5,486,251, Cl. 156-89.000.
Leung, Roger Y.-K.; and Gonczy, Stephen T., 5,486,250, Cl. 156-89.000.
Patko, Joseph M., 5,485,898, Cl. 188-71.500.

Allison, Charles R.: *See*—
Borrego, Diego A.; Greenland, Alan R.; Allison, Charles R.; Bordo, Robert A.; and Stringfellow, Steven A., 5,486,840, Cl. 345-7.000.

Allran, Gary G.: *See*—
Dinallo, Chris A.; Koval, Michael J.; Lawton, William W.; Paulat, Martin J., Jr.; Tyler, John G.; Winters, Scott L.; and Allran, Gary G., 5,487,167, Cl. 395-650.000.

Alps Electric Co., Ltd.: *See*—
Ishitaka, Yoshihiko; Sato, Yumiko; Abe, Munemitsu; Sasaki, Yorihiko; Kano, Mitsuru; Sato, Arao; and Sugawara, Kiyomi, 5,486,403, Cl. 428-167.000.

Altekrüger, Burkhard; Gesche, Roland; Flachsel, Martin; and Aufreiter, Joachim, to Leybold Aktiengesellschaft. Method and apparatus for pulling monocrystals from a melt. 5,485,802, Cl. 117-14.000.

Altera Corporation: *See*—
Southgate, Timothy J., 5,487,143, Cl. 395-157.000.
Veenstra, Kerry, 5,486,775, Cl. 126-38.000.

Althin Medical, Inc.: *See*—
Peterson, Bruce A.; Connell, Mark E.; Bedient, Robert A.; Elsen, Raymond; Hogard, Michael E.; Johnson, Harley D.; Kelly, Thomas D.; Long, Jean M.; Preston, William G., Jr.; and Smejtek, Dalibor J., 5,486,286, Cl. 210-87.000.

Alumina Ceramics Co. (ACI): *See*—
Talbert, Lloyd G.; and Brazil, Stephen M., 5,486,496, Cl. 501-90.000.

Alvarez, Vincent E.: *See*—
Mitchell, James D.; Alvarez, Vincent E.; Carty, Daniel T.; and Latham, James R., 5,486,212, Cl. 8-142.000.

Alyn Corporation: *See*—
Carden, Robin A., 5,486,223, Cl. 75-244.000.

Amano, Hideaki: *See*—
Yoshida, Takeshi; Amano, Hideaki; Kohno, Takashi; Mori, Kenji; Yoshida, Takashi; and Hirai, Hiromu, 5,486,965, Cl. 360-106.000.

Amatsu, Toshihiro: *See*—
Nakaya, Hidekazu; and Amatsu, Toshihiro, 5,485,971, Cl. 242-381.100.

Amax Coal West, Inc.: *See*—
Corso, Ronald, 5,486,998, Cl. 364-152.000.

Amdahl Corporation: *See*—
Cossock, David, 5,487,166, Cl. 395-600.000.

Amelina, Iam R.; Mooney, David M.; and Stoodley, Kevin A., to International Business Machines Corporation. Method and procedure call mechanism for calling 16-bit functions from 32-bit functions. 5,487,158, Cl. 395-375.000.

Amemiya, Shinji: *See*—
Oda, Kenzo; and Amemiya, Shinji, 5,486,122, Cl. 439-752.000.

American Colloid Company: *See*—
Henderson, John A.; Tomlin, Anthony S.; and Lucas, David M., 5,486,569, Cl. 525-116.000.

American Home Products Corporation: *See*—
Failli, Amedeo A.; Bleyman, Oleg I.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,486,522, Cl. 514-291.000.
Failli, Amedeo A.; Bleyman, Oleg I.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,486,523, Cl. 514-291.000.
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Yardley, John P.; Fletcher, Horace, III; Kelly, Michael G.; and White, Alan C., 5,486,518, Cl. 514-254.000.

American Maize Technology, Inc.: *See*—
Yoder, David; Chang, Shau-Gan; Xu, Ansui; and Domoras, Thomas, 5,486,375, Cl. 426-582.000.

American Standard Inc.: *See*—
Guy, Stephen E.; Sulfstede, Louis E.; and Hillmer, Eric, 5,485,954, Cl. 236-78.00R.

Amerigon, Inc.: *See*—
Diller, Robert W.; and Pavlat, Jeffrey W., 5,487,002, Cl. 364-424.010.

Amestica, Luis A.: *See*—
Marin-Carrillo, Edgar M.; Amestica, Luis A.; Figueroa, Francisco R.; and Ramirez-Semeco, Ana M., 5,486,297, Cl. 252-8.600.

AMP Corporation: *See*—
Voege, James A.; Voege, Richard B.; and Voege, John S., 5,485,983, Cl. 251-206.000.

Amsallen, Marcel, to Eaton Corpoaration. Control system/method for automated mechanical transmission systems. 5,487,004, Cl. 364-424.100.

Amundsen, Thomas L. Automatic transmission cooler flushing device. 5,485,857, Cl. 134-102.200.

An, Ki Ju, to Kumsan Material Co., Ltd. Raw material for producing ferrite dust for friction elements and method of reducing the same. 5,486,229, Cl. 106-36.000.

Analog Devices, Inc.: *See*—
Kierse, Oliver J., 5,486,720, Cl. 257-659.000.
Spitalny, Paul; and Mallinson, Martin, 5,486,791, Cl. 330-282.000.

Analogic Corporation: *See*—
Dobbs, John; and Banks, David, 5,487,098, Cl. 378-19.000.

Andersen Corporation: *See*—
Deaner, Michael J.; Puppin, Giuseppe; and Heikkila, Kurt E., 5,486,553, Cl. 524-13.000.

Andersen, Svend V.: *See*—
Topholm, Jan; Andersen, Svend V.; and Westermann, Soren E., 5,487,012, Cl. 364-474.050.

Anderson, James L., Jr.: *See*—
Guyomard, Daniel; Anderson, James L., Jr.; Frank, Alfred; and Chavaillaz, Georges, 5,485,941, Cl. 222-1.000.

Ando Electric Co., Ltd.: *See*—
Nagashima, Shinya, 5,486,918, Cl. 356-346.000.

Andonovic, Ivan: *See*—
Cruden, Andrew J.; McDonald, James R.; Andonovic, Ivan; Allan, Kenneth; and Porrelli, Raymond A., 5,486,754, Cl. 324-96.000.

Andresen, Bernhard H.; and Cline, Roger A., to Texas Instruments Incorporated. Autoranging digital analog phase locked loop. 5,487,093, Cl. 375-376.000.

Andrew Corporation: *See*—
Dienes, Geza, 5,486,838, Cl. 343-781.00R.

Andrews, Steven W., to Allergan, Inc. Cyclopentane heptanoic or heptenoic acid, 2-arylalkyl or arylalkenyl and derivatives as therapeutic agents. 5,486,540, Cl. 514-530.000.

Andros, Marc R.: *See*—
Taylor, Robert D.; and Andros, Marc R., 5,486,248, Cl. 149-109.600.

Angelastro, Michael R.: *See*—
Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Curran, Timothy T.; and Johnston, J. O'Neal, 5,486,511, Cl. 514-178.000.

Angell, Adrian J. W.: *See*—
Capeci, Scott W.; Osborn, James W.; Angell, Adrian J. W.; and van Dijk, Paul, 5,486,303, Cl. 252-89.100.

Anglin, Noah L.: *See*—
Ichikawa, Shinpei; Hamerton-Kelly, Paul R.; and Anglin, Noah L., 5,486,942, Cl. 359-83.000.

Antikainen, Veijo; Paukkunen, Ari; Stormbom, Lars; Jauhiainen, Hannu; and Ponkala, Jorma, to Vaisala Oy. Method of measurement of relative humidity, in particular in radiosondes, and humidity detectors that make use of the method. 5,485,747, Cl. 73-335.030.

Antranikian, Garabed; and Jørgensen, Per L., to Novo Nordisk A/S. Thermostable Fervidobacterium pullulanases. 5,486,469, Cl. 435-210.000.

Aoki, Makiko: *See*—
Furutani, Kiyohiro; Yamauchi, Tadaaki; and Aoki, Makiko, 5,487,043, Cl. 365-203.000.

Aoyama, Masahiko, to Sumitomo Wiring Systems, Ltd. Battery terminal. 5,486,434, Cl. 429-178.000.

Apache Technologies, Inc.: *See*—
Ake, DuWain K., 5,486,690, Cl. 250-206.100.

Apple Computer, Inc.: *See*—
Capps, Stephen P.; and Gannholm, Martin R., 5,487,054, Cl. 368-185.000.
Heyl, Lawrence F., 5,486,929, Cl. 358-320.000.

Applied Materials, Inc.: *See*—
Gronet, Christian M.; and Gibbons, James F., 5,487,127, Cl. 392-416.000.
Shamouilian, Shamouil; and Tanase, Yoshi, 5,486,975, Cl. 361-234.000.
Ye, Yan; Rhoades, Charles S.; and Yin, Gerald Z., 5,486,235, Cl. 134-1.100.

Arai, Masatoshi; Inoue, Yoshifumi; and Ozai, Toshiyuki, to Shin-Etsu Chemical Co., Ltd. Primer compositions. 5,486,567, Cl. 524-863.000.

Arai, Takashi, to Canon Kabushiki Kaisha. Camera-integrated video recorder system having mountable and demountable remote-control unit. 5,486,852, Cl. 348-211.000.

Arakawa, Shigehiro: *See*—
Nishihara, Akira; Nakamura, Akihiro; and Arakawa, Shigehiro, 5,486,420, Cl. 428-405.000.

Aranyi, Ernie: *See*—
Mudry, Matthew; Aranyi, Ernie; and Nicholas, David A., 5,486,189, Cl. 606-171.000.

Arcadian Fertilizer, L.P.: *See*—
Kelley, David A., 5,486,246, Cl. 149-2.000.

Ariga, Yasuo; and Hirooka, Eiji, to Nohmi Bosai Ltd. Fire detector having optic base clamping optic elements to a circuit board. 5,486,816, Cl. 340-630.000.

Arike, Shigeharu; Iwasaki, Yorio; Shinada, Eiichi; Okamura, Toshiro; Murakami, Kanji; and Nakazato, Yuichi, to Hitachi Chemical Co., Ltd. Multiple wire adhesive on a multiple wire wiring board. 5,486,655, Cl. 174-259.000.

Arima, Hideaki, to Mitsubishi Denki Kabushiki Kaisha. DRAM having peripheral circuitry in which source-drain interconnection contact of a MOS transistor is made small by utilizing a pad layer and manufacturing method thereof. 5,486,712, Cl. 257-296.000.

Arima, Hidetoshi, to Tokai Kogyo Co., Ltd. Seal molding method and device. 5,486,325, Cl. 264-167.000.

Arisawa, Mikio; Götschi, Erwin; Hebeisen, Paul; Kamiyama, Tsutomu; Link, Helmut; Masciadri, Raffaello; Shimada, Hisao; and Watanabe, Junko, to Hoffmann-La Roche Inc. Process for the preparation of DNA gyrase inhibitors. 5,486,466, Cl. 435-106.000.

Aristo International Corporation: *See*—
Tolendano, Jacob M., 5,485,921, Cl. 206-545.000.

Arjo Wiggins S.A.: *See*—
Doublet, Pierre; Passebecq, Claude; and Bigot, Etienne, 5,486,928, Cl. 358-299.000.

Arjunan, Palanisamy, to Exxon Chemical Patents Inc. Process for converting polyketones to polyesters. 5,486,326, Cl. 264-176.100.

Arpaio, Jerry. Vibratory tumbling machine vessel for burnishing or cleansing metal, plastic or ceramic elements. 5,486,135, Cl. 451-326.000.

Array Microsystems, Inc.: *See*—
Lew, Stephen D.; Luikuo, Gerry C.; and Kopet, Thomas G., 5,486,876, Cl. 348-719.000.

Arsac, Jean-Francois; Bonabal, Catherine; and Laurent, Betty, to Elf Atochem S.A. Heat-sealable and peelable film for polystyrene containers and process for sealing by means of said film. 5,486,571, Cl. 525-227.000.

Asahara, Norimi; Fukumura, Kagenori; Hojo, Yasuo; and Ozaki, Kazuhisa, to Aisin AW Co., Ltd. Hydraulic control circuit for automatic transmission. 5,486,146, Cl. 477-65.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Iima, Mitsunori; Hara, Kazuya; and Kaneko, Atsumi, 5,486,688, Cl. 235-462.000.

Asanger, James T.: *See*—
Robb, Richard A.; Grubb, Michael J.; Grubb, John J.; and Asanger, James T., 5,485,860, Cl. 134-166.00C.

Asano, Hiroaki; Kobayashi, Yasuhiro; Hotta, Shigeo; Yamakawa, Yoichi; Ito, Akira; and Sugiura, Hirotaka, to Toyoda Koki Kabushiki Kaisha. Apparatus for detecting contact with rotating body. 5,485,752, Cl. 73-660.000.

Asayama, Junko: *See*—
Takimoto, Akio; Wakemoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, 5,486,442, Cl. 430-78.000.

Asco Screen Products S.r.l.: *See*—
Rovaris, Lorenzo, 5,485,781, Cl. 101-129.000.

Ash, Carlton E., to Shell Oil Company. Crosslinked polyketone polymer. 5,486,581, Cl. 525-539.000.

Ashby, David C. Belt drive transmission. 5,486,143, Cl. 474-148.000.

Ashimori Kogyo Kabushiki Kaisha: *See*—
Nakaya, Hidekazu; and Amatsu, Toshihiro, 5,485,971, Cl. 242-381.100.

Aso, Takayuki; Ona, Isao; and Ozaki, Masaru, to Dow Corning Toray Silicone Company, Ltd. Fiber treatment compositions. 5,486,298, Cl. 252-8.600.

Aso, Yasuhiro: *See*—
Kakuma, Satoshi; Uriu, Shiro; Yoshimura, Shuji; Aso, Yasuhiro; and Murayama, Masami, 5,487,063, Cl. 370-56.000.

AST Research, Inc.: *See*—
Brainard, Gerald L., 5,486,749, Cl. 320-9.000.

AT&T Bell Laboratories: *See*—
Dautremont-Smith, William C.; Graebner, John E.; Jin, Sungho; and Katz, Avishay, 5,486,263, Cl. 216-33.000.

AT&T Corp: *See*—
Burges, Christopher J.; Le Cun, Yann A.; and Matan, Ofer, 5,487,117, Cl. 382-173.000.

AT&T Corp.: *See*—
Baals, Kimberly A.; Chylinski, Kathleen J.; Kall, Darren A.; and Smith, Gary C., 5,487,104, Cl. 379-96.000.
Baumert, Robert J.; and Pritchett, Robert L., 5,486,783, Cl. 327-147.000.
Kammlott, Guenther W.; Kosinski, Sandra G.; Krause, John T.; and Riggs, Richard S., 5,487,125, Cl. 385-96.000.

AT&T Global Information Solutions Company: *See*—
Bemis, Edward D., 5,487,160, Cl. 395-441.000.

AT&T IPM Corp.: *See*—
Atkins, Jean; Harris, Richard M.; Ladieu-Walton, Julie M.; and McChristian, David C., 5,487,107, Cl. 379-144.000.
Slusky, Ronald D., 5,487,111, Cl. 379-211.000.
Veitschegger, William K., 5,486,798, Cl. 333-116.000.

Atkins, Jean; Harris, Richard M.; Ladieu-Walton, Julie M.; and McChristian, David C., to AT&T IPM Corp. Method and apparatus for processing telephone calls charged to credit cards. 5,487,107, Cl. 379-144.000.

Atkins, Richard S.; Gibson, Tommy W.; and Ransome, Philip P., to AGR Industries Limited. Programmable dialler for a mobile telephone. 5,487,108, Cl. 379-355.000.

Atsugi Unisia Corporation: *See*—
Kakizaki, Shinobu; Taniguchi, Minoru; and Kanai, Fukashi, 5,487,006, Cl. 364-424.050.

Atwood, Gregory E.: *See*—
Keeney, Stephen N.; and Atwood, Gregory E., 5,487,033, Cl. 365-185.190.

Aufreiter, Joachim: *See*—
Altekrüger, Burkhard; Gesche, Roland; Flachsel, Martin; and Aufreiter, Joachim, 5,485,802, Cl. 117-14.000.

Austin, Fred M.: *See*—
Miller, Roy R.; Clark, Brian K.; and Austin, Fred M., 5,485,925, Cl. 209-615.000.

Austin, Kevin L.: *See*—
Richardson, Charles T., Jr.; and Austin, Kevin L., 5,487,103, Cl. 379-88.000.

Austin, Rickey G.: *See*—
Koenck, Steven E.; Austin, Rickey G.; and Boatwright, Darrell L., 5,487,161, Cl. 395-442.000.

Autoft Industries, Limited: *See*—
Baker, Malcolm J., 5,485,716, Cl. 56-14.300.

Automobiles Citroen: *See*—
Petiot, Jean-Paul, 5,486,039, Cl. 303-22.600.

Automobiles Peugeot: *See*—
Petiot, Jean-Paul, 5,486,039, Cl. 303-22.600.

Auxier, Thomas A.; and Hall, Kenneth B., to United Technologies Corportion. Leading edge cooling of turbine airfoils. 5,486,093, Cl. 416-97.00R.

Auyeung, Cheung; O'Connell, Kevin J.; and Levine, Stephen N., to Motorola, Inc. Method for determining whether to intra code a video block. 5,486,863, Cl. 348-420.000.

AV Flexologic B.V.: *See*—
Van Der Horst, Hans, 5,485,782, Cl. 101-216.000.

Avery, John R., to P.I., Inc. Reusable thermal pack and flow retardant gel for use therein. 5,486,206, Cl. 607-104.000.

Axicon Gear Company: *See*—
Rouverol, William S., 5,485,761, Cl. 74-462.000.

Axis USA, Inc.: *See*—
Sbalchiero, Federico; and Rossi, Alessandro, 5,486,672, Cl. 219-86.410.

Axline, Robert M., Jr.; Sloan, George R.; and Spalding, Richard E., to United States of America, Energy. Radar transponder apparatus and signal processing technique. 5,486,830, Cl. 342-43.000.

Aya, Yoichiro: *See*—
Sano, Keiichi; and Aya, Yoichiro, 5,486,237, Cl. 136-258.000.

Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Recording apparatus which twice ejects droplets to the same position and image forming apparatus with u-shaped material path. 5,486,848, Cl. 347-15.000.

Aydin, Oral: *See—*
Kroener, Hubertus; Schupp, Eberhard; Wistuba, Eckehardt; Aydin, Oral; Schwarzenbach, Elmar; and Schnell, Klaus, 5,486,586, Cl. 526-332.000.

Ayers, Gregory M.; Alferness, Clifton A.; and White, Harley G. Atrial defibrillator and method for providing interval timing of successive intervals prior to cardioversion. 5,486,198, Cl. 607-5.000.

Azechi, Syuuichi: *See—*
Itagaki, Akinari; Azechi, Syuuichi; Kuwata, Satoshi; Tsutsumi, Yousuke; and Kodaiku, Masanori, 5,486,549, Cl. 523-161.000.

Azuma, Takanobu: *See—*
Masaki, Koichi; Fukuzawa, Yoshinao; Kitazawa, Kanji; Azuma, Takanobu; Naganuma, Naohiro; and Hosoda, Tetsuo, 5,486,731, Cl. 310-180.000.

Azuma, Tsukasa: *See—*
Takenouchi, Tomoo; Ichinomiya, Yoshiaki; Ishizaka, Junji; Itagaki, Junji; Ohhashi, Shuzo; Azuma, Tsukasa; and Tanaka, Yasuhiko, 5,487,082, Cl. 373-42.000.

Azumi, Takashi: *See—*
Shiokawa, Junji; Chiba, Hiroshi; Murakami, Toshio; Todaka, Yoshihiro; Ohsaka, Ichiro; and Azumi, Takashi, 5,486,860, Cl. 348-354.000.

B & G Ventures, Inc.: *See—*
Bertwell, Dale E.; and Markham, Joseph P., 5,485,807, Cl. 119-93.000.

B and P Plastics: *See—*
Browne, Bruce, 5,486,009, Cl. 273-424.000.

B&H Manufacturing Company: *See—*
Otruba, Svatoboj, 5,486,253, Cl. 156-215.000.

B.M.D., Inc.: *See—*
Drake, Charles S.; Williams, Bernhard O.; Dombrowski, Adrian T.; and Harth, Athur R., 5,487,010, Cl. 364-479.000.

Baals, Kimberly A.; Chylinski, Kathleen J.; Kall, Darren A.; and Smith, Gary C., to AT&T Corp. Arrangement for displaying menu screens on a telephone terminal. 5,487,104, Cl. 379-96.000.

Baba, Hajime: *See—*
Fukaya, Haruhiko; Abe, Takashi; Hayashi, Eiji; Hayakawa, Yoshio; and Baba, Hajime, 5,486,275, Cl. 204-157.600.

Babbitt, Richard W.: *See—*
Drach, William C.; Babbitt, Richard W.; and Koscica, Thomas E., 5,487,014, Cl. 364-481.000.

Babcock & Wilcox Company, The: *See—*
Jeffers, Larry A.; and Malito, Michael L., 5,486,915, Cl. 356-318.000.

Badley, Rickey D.; Benham, Elizabeth A.; and McDaniel, Max P., to Phillips Petroleum Company. Chromium catalyst compositions. 5,486,584, Cl. 526-95.000.

Bailey, James R.; and Harrison, Larry E., to Exxon Production Research Company. Low-density ball sealer for use as a diverting agent in hostile environment wells. 5,485,882, Cl. 166-284.000.

Bair, Thomas I.; and Camp, Carl E., to Du Pont de Nemours, E. I., and Company. Adsorbent biocatalyst porous beads. 5,486,292, Cl. 210-616.000.

Bajnógel, Judit; Blaskó, Gábor; Budai, Zoltán; Schmidt, Éva; Egyed, András; Fekete, Márton; Gacsályi, István; Gyertyán, István; Mezei, Tibor; Reiter née Esses, Kalára; Simig, Gyula; Szemerédi, Katalin; and Szirt née Kiszelly, Enikő, to Egis Gyogyszergyar Rt. Basic ethers and process for the preparation thereof. 5,486,528, Cl. 514-331.000.

Baker, Clark R., Jr., to Nellcor Puritan Bennett Incorporated. Pulse oximeter using a virtual trigger for heart rate synchronization. 5,485,847, Cl. 128-666.000.

Baker, Malcolm J., to Autoft Industries, Limited. Double row cane harvester. 5,485,716, Cl. 56-14.300.

Baker, Rick. Personalized instructional aid. 5,486,001, Cl. 273-183.100.

Balch, Richard A.: *See—*
Horan, Patrick J.; Balch, Richard A.; Elmore, David D.; and Legere, Joseph R., 5,486,755, Cl. 324-110.000.

Balducci, Sergio; and Giraldi, Roberto, to Balducci, Sergio. Covering for the partially coating of articles such as broom backs and articles such as broom backs so covered. 5,485,648, Cl. 15-175.000.

Baldwin, Leo B., to Emhart Glass Machinery Investments Inc. Glassware inspection machine comprising diffused light sources and two-dimensional cameras. 5,486,692, Cl. 250-223.00B.

Bales, Stephen E.: *See—*
Farah, Hani; and Bales, Stephen E., 5,486,577, Cl. 525-469.000.

Ballagh, Robert H.; and Jones, Jeff B., to St. Joseph Health Centre; Lawson Research Institute, The; Ballagh, Robert H.; and Jones, Jeff B. Method of treating tumour cells using catalase. 5,486,360, Cl. 424-94.400.

Ballard, Dan, to Reticular Systems, Inc. Real-time rule based processing system. 5,487,134, Cl. 395-51.000.

Ballard Power Systems Inc.: *See—*
Gorbell, Brian N.; Wozniczka, Beguslav M.; and Chow, Clarence Y., 5,486,430, Cl. 429-35.000.

Balmer, Keith: *See—*
Guttag, Karl M.; Poland, Sydney W.; Balmer, Keith; Gove, Robert J.; and Read, Christopher J., 5,487,146, Cl. 395-166.000.

Bank, Howard M.; and Decker, Gary T., to Dow Corning Corporation. Unsaturated alcohols as accelerators for hydrosilation. 5,486,637, Cl. 556-479.000.

Banks, David: *See—*
Dobbs, John; and Banks, David, 5,487,098, Cl. 378-19.000.

Baranski, Celeste: *See—*
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.

Barbee, Troy W., Jr.; Johnson, Gary W.; and O'Brien, Dennis W., to University of California, Regents of the. High performance capacitors using nano-structure multilayer materials fabriction. 5,486,277, Cl. 204-192.150.

Bard Manufacturing Company: *See—*
Derks, Irvin L., 5,485,878, Cl. 165-16.000.

Bard, Simon; Strat, Askold; and Dvorkis, Paul, to Symbol Technologies, Inc. Scanner module for symbol scanning system. 5,486,944, Cl. 359-198.000.

Barker, B. Thomas: *See—*
Hildebrand, Bryan D.; Small, Laura C.; Yuan, Hansen A.; Barker, B. Thomas; Morrison, Matthew M.; Salehi, Abraham; and Smith, Forrest C., 5,486,176, Cl. 606-71.000.

Barker, Robert A.: *See—*
Romm, Michael; Barker, Robert A.; and Morgan, Stuart K., 5,485,932, Cl. 211-87.000.

Barletta, Paolo: *See—*
Vacca, Alberto; and Barletta, Paolo, 5,486,451, Cl. 430-569.000.

Barnett, Charles J.; and Wilson, Thomas M., to Eli Lilly and Company. Intermediates for peparing antifolate compounds. 5,486,614, Cl. 546-207.000.

Barnett, Mark. Portable, public use reading glasses eye tester. 5,486,879, Cl. 351-223.000.

Barr, Graham M.: *See—*
Simpson, Richard; Oakland, Erick D.; and Barr, Graham M., 5,487,022, Cl. 364-715.040.

Barr, John F., Jr. Hair dryer caddy. 5,485,931, Cl. 211-70.600.

Barrett, David W.: *See—*
Kowalczyk, Thomas M.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kulak, Richard E.; and Barrett, David W., 5,485,896, Cl. 187-330.000.

Barrett, Terence W. Active signalling systems. 5,486,833, Cl. 342-204.000.

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Procházka, Zdenko; Bláha, Ivo; Žertová, Miroslava; Slaninová, Jiřina; Velek, Jiří ; Škopková, Jana; Lebl, Michal; Barth, Tomislav; Maletínská, Lenka; and Vilhardt, Hans, 5,486,596, Cl. 530-329.000.

Barton, Denny R. Fishing lure retrieval apparatus. 5,485,696, Cl. 43-17.200.

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Cowley, Richard C., 5,486,104, Cl. 425-142.000.

BASF Aktiengesellschaft: *See—*
Hagen, Helmut; Nilz, Gerhard; Walter, Helmut; and Landes, Andreas, 5,486,618, Cl. 548-362.100.
Horn, Dieter; Lueddecke, Erik; Gierulski, Alfred; Kroehl, Thomas; and Lorencak, Primoz, 5,486,904, Cl. 356-73.000.
Kiefer, Hans; Betz, Roland; and Bewert, Wolfgang, 5,486,363, Cl. 424-442.000.
Kroener, Hubertus; Schupp, Eberhard; Wistuba, Eckehardt; Aydin, Oral; Schwarzenbach, Elmar; and Schnell, Klaus, 5,486,586, Cl. 526-332.000.
Reinhardt, Robert; Reichelt, Helmut; and Merger, Roland, 5,486,609, Cl. 544-173.000.

BASF Corporation: *See—*
Guyomard, Daniel; Anderson, James L., Jr.; Frank, Alfred; and Chavaillaz, Georges, 5,485,941, Cl. 222-1.000.
Hagen, Gerry A.; and Li, Wei, 5,486,417, Cl. 428-357.000.
Ray, Billy E.; Cox, Gregg T.; Bryant, Fred D.; Ray, Jimmie A.; Christopher, B. Joe; and Holcombe, Dan C., 5,485,967, Cl. 242-18.00A.

Bass, Brian M.; Ku, Edward H.; Lin, Bou-Chung; and Sanaye, Simin H., to International Business Machines Corporation. Data processing system having dynamic priority task scheduling capabilities. 5,487,170, Cl. 395-732.000.

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Xu, Feng J.; Yu, Yin H.; and Bast, Robert C., Jr., 5,486,456, Cl. 435-7.230.

Bastasch, Paul M.; Hanson, Randyl C.; Hill, Laclede L.; Norton, William E.; and Schoenbuchner, Hans W., to United Bakery Equipment Company. Bun slicing machine. 5,485,772, Cl. 83-873.000.

Bastian, Udo; and Stein, Manfred, to Herberts GmbH. Process for producing multi-layer coatings by the use of clear lacquers which are capable of polymerization in radicalic and/or cationic manner. 5,486,384, Cl. 427-493.000.

Bauer, Alois: *See—*

Hofmann, Jörg; Knetsch, Harald; Liebich, Kurt; Opper, Reinhold; Wiessler, Hans; and Bauer, Alois, 5,486,678, Cl. 219-127.000.

Bauer, François, to Institut Franco-Allemand de Recherches de Saint-Louis. Method of depolarizing a ferroelectric material using electrical means and its application to obtain a ferroelectric material of reinforced dielectric strength. 5,486,320, Cl. 264-408.000.

Bauman, Robert P. Method of precise guidance for directional atherectomy using ultrasound. 5,485,840, Cl. 128-660.030.

Baumert, Robert J.; and Pritchett, Robert L., to AT&T Corp. Method and apparatus for providing clock de-skewing on an integrated circuit board. 5,486,783, Cl. 327-147.000.

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Lai, Yu-Chin; and Valint, Paul L., Jr., 5,486,579, Cl. 525-479.000.

Baxter, Larry K.; and Coffey, John J., to PictureTel Corporation. Electrical cable interface for electronic camera. 5,486,853, Cl. 348-222.000.

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Guillemet, Guy, 5,485,705, Cl. 52-656.900.
Guillemet, Guy, 5,485,709, Cl. 52-786.130.

Bayer Aktiengesellschaft: *See*—
Eichenauer, Herbert; Piejko, Karl-Erwin; Bunte, Hans-Jürgen; and Thiem, Hans-Jürgen, 5,486,583, Cl. 526-68.000.
Kleiner, Frank-Gerald; and Becker, Robert, 5,486,642, Cl. 558-270.000.
Podszun, Wolfgang; and Müller, Michael, 5,486,548, Cl. 523-115.000.

Bayley, Gwain; Grob, Matthew S.; Karmi, Gadi; Kimball, Robert H.; and Propach, David S., to Qualcomm Incorporated. Method of invoking and canceling voice or data service from a mobile unit. 5,487,175, Cl. 455-54.200.

Bayley, Robert D.; Fox, Carol A.; Hoffend, Thomas R.; Paxson, James R.; and Grushkin, Bernard, to Xerox Corporation. Polyester processes for the preparation of toner. 5,486,444, Cl. 430-109.000.

Bayya, Shyam S.: *See*—
Jewell, John M.; Harbison, Barry B.; Aggarwal, Ishwar D.; and Bayya, Shyam S., 5,486,495, Cl. 501-10.000.

Beagley, Thomas; Kapaan, Hendrikus J.; Berryman, Leslie; and Message, Olivier, to SKF Industrial Trading & Development Company B.V. Bearing unit for a vehicle wheel. 5,486,053, Cl. 384-513.000.

Beck, Erhard; and Dinkel, Dieter, to ITT Automotive Europe GmbH. Brake pressure controller for a hydraulic vehicle brake system. 5,486,040, Cl. 303-113.200.

Becker, Heinrich, to Mannesmann Aktiengesellschaft. Process and apparatus for the treatment of the waste gases of an arc furnace. 5,487,081, Cl. 373-9.000.

Becker, Robert: *See*—
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Beckerman, Joseph W.: *See*—
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Zygourakis, Kyriacos; Bednarczyk, John L.; McIntyre, Bradley W.; and Glacken, Michael W., 5,487,112, Cl. 382-6.000.

Beenfeldt, Eric; and Eason, Richard O., to Dexter Shoe Company. Apparatus and process for trimming a sole of a shoe. 5,485,643, Cl. 12-85.000.

Beiswenger, John L.; and Schwimmer, Robert L., to Technomarket, L.P. Digital clock. 5,487,053, Cl. 368-69.000.

Bekki, Toshihiko: *See*—
Hirano, Hirofumi; Hasegawa, Koh; Inoue, Hiroyuki; Bekki, Toshihiko; and Ikado, Masaharu, 5,485,991, Cl. 271-121.000.

Bekki, Yoichiro: *See*—
Hashiguchi, Koichi; Matsumoto, Yoshihiro; Imanaka, Makoto; Hira, Takaaki; Ikeda, Rinsei; Nishiyama, Naoki; Totsuka, Nobuo; Bekki, Yoichiro; and Nabae, Motohiro, 5,486,243, Cl. 148-552.000.

Belden Wire & Cable Company: *See*—
Gareis, Galen M., 5,486,649, Cl. 174-36.000.

Bell, Allyn R.: *See*—
Strunk, Richard J.; and Bell, Allyn R., 5,486,610, Cl. 544-311.000.

Bell & Howell Phillipsburg Company: *See*—
McCay, Steve W.; Harshman, Keith A.; Gillette, Stephen J.; and Wentzel, Dale A., 5,485,989, Cl. 271-2.000.

Bell Communications Research Inc.: *See*—
Kant, Krishna, 5,487,072, Cl. 371-32.000.

Bell, James S.; Herman, Patricia L.; and Phillips, Richard I., to Dell USA, L.P. Beveled edge circuit board with channeled connector pads. 5,486,657, Cl. 174-261.000.

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Belleau, Bernard, deceased (by Pierrette Belleau, executrix); and Nguyen-Ba, Nghe, to BioChemPharma, Inc. 1,3-oxathiolanes useful in the treatment of hepatitis. 5,486,520, Cl. 514-274.000.

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Belleau, Bernard, deceased; and Nguyen-Ba, Nghe, 5,486,520, Cl. 514-274.000.

Bello, Vittorio: *See*—
Manganiello, Fausto; Duruz, Jean-Jacques; and Bello, Vittorio, 5,486,278, Cl. 204-243.00R.

BellSouth Corporation: *See*—
Sutton, Robert A., 5,487,109, Cl. 379-410.000.

Bemis, Edward D., to AT&T Global Information Solutions Company; Hyundai Electronics America; and Symbios Logic Inc. Concurrent image backup for disk storage system. 5,487,160, Cl. 395-441.000.

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Bemis, Peter F.; Albrecht, Loren C.; and Schick, Steven F., 5,486,327, Cl. 264-211.210.

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Badley, Rickey D.; Benham, Elizabeth A.; and McDaniel, Max P., 5,486,584, Cl. 526-95.000.

Bening, Robert C.; and St. Clair, David J., to Shell Oil Company. Protected functional initiated polymers capped with low surface energy fluorocarbons. 5,486,568, Cl. 525-102.000.

Bennett, James L. Cooler door display rack. 5,486,044, Cl. 312-321.500.

Benthos, Inc.: *See*—
Nellessen, Peter, Jr., 5,485,973, Cl. 242-386.000.

Berens, Randolph L.: *See*—
Marr, J. Joesph; Krug, Edward C.; Berens, Randolph L.; and Ke, Ou-Yang, 5,486,535, Cl. 514-450.000.

Berg Technologies, Inc.: *See*—
Northey, William A.; and Koser, James R., 5,486,115, Cl. 439-108.000.

Berger, Barry: *See*—
Samberg, Steve; and Berger, Barry, 5,485,919, Cl. 206-461.000.

Bergmann, Klaus; Schwab, Jacques; and Frauenfelder, Martin, to Mikron S. A. Agno. Machining center for machining a workpiece by means of at least two interchangeable tools. 5,486,151, Cl. 483-1.000.

Bergmans, Johannes W.: *See*—
Wong-Lam, Ho W.; Bergmans, Johannes W.; and Fisher, Kevin D., 5,487,085, Cl. 375-230.000.

Bergstrom, Richard C.: *See*—
Bowen, Terry P.; Lewis, Warren H.; and Bergstrom, Richard C., 5,487,124, Cl. 385-93.000.

Berman, Arthur L.: *See*—
Fergason, James L.; Berman, Arthur L.; and Jacobs, Stephen D., 5,486,940, Cl. 359-74.000.

Bernardus, Wilhelmus A.; and Pardijs, Hendrik J., to Stork RMS B.V. Method and device for stunning an animal for slaughter. 5,486,145, Cl. 452-58.000.

Berndt, Dale F.: *See*—
Killpatrick, Joseph E.; Berndt, Dale F.; Fritze, Keith R.; and Cary, Gregory E., 5,486,920, Cl. 356-350.000.

Bernfield, Merton: *See*—
Saunders, Scott; Bernfield, Merton; and Kato, Masato, 5,486,599, Cl. 530-395.000.

Bernhard, Gunnar: *See*—
Mathiesen, Torbjorn; Bernhard, Gunnar; and Rumsby, Phil, 5,486,546, Cl. 522-165.000.

Bernstein, Peter R.; Shaw, Andrew; Thomas, Royston M.; Veale, Chris A.; Warner, Peter; and Wolanin, Donald J., to Zeneca Limited. Certain pyridyl ketones for treating diseases involving lenkocyte elastase. 5,486,529, Cl. 514-335.000.

Beroud, Claude: *See*—
Chevroulet, Tristan; and Beroud, Claude, 5,486,019, Cl. 280-730.100.

Berryman, Leslie: *See*—
Beagley, Thomas; Kapaan, Hendrikus J.; Berryman, Leslie; and Message, Olivier, 5,486,053, Cl. 384-513.000.

Berschied, John R., Jr., to Church & Dwight Co., Inc. Homogeneous cosmetic stick products. 5,486,355, Cl. 424-65.000.

Bershas, James P.; Kelly, Timm L.; and Rochfort, Gary L., to Henkel Corporation. Aqueous lubricant and surface conditioner for formed metal surfaces. 5,486,316, Cl. 252-547.000.

Bertwell, Dale E.; and Markham, Joseph P., to B & G Ventures, Inc. Hand-held brush. 5,485,807, Cl. 119-93.000.

Berwanger, Fred W., to AlliedSignal Inc. Aircraft brake piston hydraulic adjuster assembly. 5,485,902, Cl. 188-196.00A.

Bessho, Yoshihiro: *See*—
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Betz Laboratories, Inc.: *See*—
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Hollander, Orin, 5,486,334, Cl. 422-16.000.
Petrille, Joseph C., III; Vasconcellos, Stephen R.; and Werner, Michael W., 5,486,296, Cl. 210-749.000.

Betz, Roland: *See*—
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Bewert, Wolfgang: *See*—
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Beyer, Eckhard: *See*—
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BGK Finishing Systems, Inc.: *See*—

Eppeland, John R.; and Mannerud, Jack E., 5,485,985, Cl. 266-87.000.
Bhaskar, B. R. Udaya, to Comsat Corporation. Transform vector quantization for adaptive predictive coding. 5,487,086, Cl. 375-243.000.
Biehl, Brent G.; and Biehl, Michael J. Cellulosic composition. 5,486,217, Cl. 44-597.000.
Biehl, Michael J.: *See—*
Biehl, Brent G.; and Biehl, Michael J., 5,486,217, Cl. 44-597.000.
Biemeck, Robert W.: *See—*
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Biglieri, Ezio: *See—*
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Bigot, Etienne: *See—*
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Billia, Mario; and Siladji, Sigrun, to Solco Basel AG; and Greiter AG. Antisun product. 5,486,353, Cl. 424-59.000.
Billias, Athan: *See—*
Kay, Stephen R.; Billias, Athan; Igoshi, Yoshiyuki; and Hashida, Naoki, 5,486,647, Cl. 84-635.000.
Billion S.A.: *See—*
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Binney & Smith Inc.: *See—*
Miller, Richard E.; Couch, Charlene R.; and Krieger, Cheryl D., 5,486,228, Cl. 106-22.00B.
Binzer, Lothar. Modular fireplace with interchangeable burner assembly and heat exchange insert. 5,485,830, Cl. 126-512.000.
BioChemPharma, Inc.: *See—*
Belleau, Bernard, deceased; and Nguyen-Ba, Nghe, 5,486,520, Cl. 514-274.000.
Biosource Technologies, Inc.: *See—*
della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., 5,486,351, Cl. 424-59.000.
Birchler, Mark A.: *See—*
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Bishop, David F.; and Ellis, Clifford J., to Kimberly-Clark Corporation. Fibrous nonwoven web surge layer for personal care absorbent articles and the like. 5,486,166, Cl. 604-366.000.
Bivens, Thomas H. Method of continuously filtering cooking oil. 5,486,370, Cl. 426-417.000.
Bizzotto, Wladimiro. High-pressure melamine reactor. 5,486,339, Cl. 422-193.000.
Black, William E.: *See—*
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Blagaila, John H.: *See—*
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Bláha, Ivo: *See—*
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Blain, David A.: *See—*
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Blankenship, Dennis R., to Mitsubishi Semiconductor America, Inc. CMOS level shifter with feedforward control to prevent latching in a wrong logic state. 5,486,785, Cl. 327-306.000.
Blaskó, Gábor: *See—*
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Failli, Amedeo A.; Bleyman, Oleg I.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,486,524, Cl. 514-291.000.
Blomquist, Michael L., to International Electronic Research Corporation. Heat dissipating assembly. 5,486,981, Cl. 361-704.000.
Bloomberg, Dan S.: *See—*
Zdybel, Frank, Jr.; Sung, Henry W., Jr.; Pedersen, Jan O.; Smith, Z. E., III; Henderson, D. A., Jr.; Hecht, David L.; and Bloomberg, Dan S., 5,486,686, Cl. 235-375.000.
Blowers, William L.: *See—*
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Zygourakis, Kyriacos; Bednarczyk, John L.; McIntyre, Bradley W.; and Glackin, Michael W., 5,487,112, Cl. 382-6.000.
Board of Trustees operating Michigan State University: *See—*
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Boatman, Jack K.; Farnsworth, John T.; Johnson, Roger D.; and Young, Linda A., to Nestec S.A. Apparati for mixing fluid substances. 5,486,049, Cl. 366-175.200.
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BOC Group, Inc., The: *See—*
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Ross, Ian A.; and Pooley, Michael B., 5,486,226, Cl. 95-11.000.
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Watson, Richard W., 5,486,345, Cl. 423-573.100.
Bodden, Kurt S.: *See—*
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Bodem, Jack D., Jr., to Federal-Mogul Corporation. Vehicle signal lamp assembly. 5,486,991, Cl. 312-369.000.
Bodin, Stig R.: *See—*
Nordstrand, Ingrid V.; and Bodin, Stig R., 5,487,071, Cl. 370-110.100.
Boehringer Mannheim GmbH: *See—*
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Boekelheide, Lee: *See—*
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Boelke, Tim; Kling, Lothar; and Koenig, Reinhard, to Boehringer Mannheim GmbH. Use of torasemide for the treatment of brain oedemas. 5,486,530, Cl. 514-347.000.
Boersma, Drew H. Cup lid assembly. 5,485,938, Cl. 220-714.000.
Bogdanski, Michael S.: *See—*
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Boltswitch, Inc.: *See—*
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Bonne, Ulrich, to Honeywell, Inc. Determination of fuel characteristics. 5,486,107, Cl. 431-12.000.
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Periou, Pierre; Bonnefond, Xavier; Kramer, Dennis A.; and Malinowski, Mark E., 5,486,724, Cl. 307-10.100.
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Booth, Hubert J.; Steagall, Paul H., III; and Wright, Michael W., to Wellman, Inc. Method and apparatus for sorting plastic items. 5,485,964, Cl. 241-27.000.
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Borg, Torolf; and Strinning, Per E., to ITT Flygt Ab. Housing for a vortex-flow type pump. 5,486,092, Cl. 415-225.000.
Borg-Warner Automotive, Inc.: *See—*
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Borgardt, Ronald. Double-acting positive latch system for sliding doors. 5,486,026, Cl. 292-71.000.
Borgia, Julian: *See—*
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Borland International, Inc.: *See—*
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Borman, Willem F. H.; and Liu, Nan-I, to General Electric Company. Modifications of poly(alkylene cyclohexanedicarboxylate) blends. 5,486,562, Cl. 524-451.000.

Bornhorst, Randy J.: *See*—
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Boyle, William J., Jr.: *See*—
Tang, Regiankl T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundanbhai M., 5,486,593, Cl. 528-370.000.

Bozio, Robert P.: *See*—
Brown, James P.; and Bozio, Robert P., 5,485,977, Cl. 246-167.00R.

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Palandech, Robert L.; Bradley, Wayne H.; Opas, George F.; and Mitzlaff, James E., 5,486,789, Cl. 330-149.000.

Bradshaw, James L., to Intermedics, Inc. Cardiac stimulator lead connector. 5,486,202, Cl. 607-37.000.

Bradshaw, Madeline J.: *See*—
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Samra, Amarjit K., 5,486,309, Cl. 252-299.600.

Brainard, Gerald L., to AST Research, Inc. Multiple battery charger with a power source control. 5,486,749, Cl. 320-9.000.

Branagan, Daniel J.: *See*—
McCallum, R. William; and Branagan, Daniel J., 5,486,240, Cl. 148-102.000.

Brandon, Nigel P.: *See*—
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Ullmann, Roland, 5,485,778, Cl. 99-295.000.

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Brazil, Stephen M.: *See*—
Talbert, Lloyd G.; and Brazil, Stephen M., 5,486,496, Cl. 501-90.000.

Breeden, Harlan. Grass and leaf eradicator. 5,485,715, Cl. 56-13.300.

Breeden, John. Offshore jack-up rig locking system. 5,486,069, Cl. 405-198.000.

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Caron, Ronald N.; and Breedis, John F., 5,486,244, Cl. 148-554.000.

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Fischer, Craig D., deceased; Breitbart, Dennis J.; Epstein, Arnold I.; and Zabel, Dale D., 5,486,374, Cl. 426-574.000.

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Valaitis, Joseph K.; Davis, James A.; and Lohr, Frederick, 5,486,249, Cl. 156-71.000.

Bridgestone Metalpha Co., Ltd.: *See*—
Fujioka, Kaoru, 5,485,968, Cl. 242-125.200.

Bridgestone/Firestone, Inc.: *See*—
Stone, W. Ross; Palmer, Robert L.; Mochel, Virgil D.; and Karpinski, Robert P., 5,486,319, Cl. 264-406.000.

Briese, Heiko: *See*—
Kemper, Wolfgang; and Briese, Heiko, 5,486,985, Cl. 362-69.000.

Brifaud, Thierry; and Sage, Jean-Marc, to Elf Atochem S.A. Copolyoxadiazoles of block type and process for their synthesis. 5,486,592, Cl. 528-363.000.

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Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Samra, Amarjit K., 5,486,309, Cl. 252-299.600.

Brisson, James P., to International Business Machines Corporation. Generation of error messages and error recovery for an LL(1) parser. 5,487,147, Cl. 395-180.000.

British Aerospace PLC: *See*—
Green, Geoffrey C., 5,486,072, Cl. 407-32.000.

Brochu, Fernand; and Duval, Michel, to Hydro-Quebec. Additives for extruding polymer electrolytes. 5,486,435, Cl. 429-192.000.

Brooktree Corporation: *See*—
Lou, Perry W., 5,486,778, Cl. 326-71.000.

Brophy, Mark E., to ABB Air Preheater, Inc. Rotary regenerative heat exchanger. 5,485,877, Cl. 165-8.000.

Broughton, Howard B.: *See*—
Kalindjian, Sarkis B.; Broughton, Howard B.; Low, Caroline M. R.; McDonald, Iain M.; Hull, Robert A. D.; Shankley, Nigel P.; Buck, Ildiko M.; Steel, Katherine I. M.; and Davies, Jonathan M. R., 5,486,597, Cl. 530-331.000.

Broussard, Fabio; Adovasio, Mauro; Callierotti, Corrado; Taroni, Gianbattista; and Roncalli, José, to Great Lakes Chemical Italia S.r.l. Vulcanization accelerators. 5,486,613, Cl. 546-181.000.

Brouwer, Ivan R.: *See*—
Lippmann, Raymond; Schnars, Michael J.; Nelson, James E.; Brouwer, Ivan R.; and Pachciarz, Mahlon R., 5,485,740, Cl. 73-1.00J.

Brouwer, Walter G.; Dalrymple, Alan W.; Felauer, Ethel E.; and McDonald, Paul T., to Uniroyal Chemical Company, Inc.; Uniroyal Chemical Ltd.; and Ltee. Pyrimidinyl aryl ketone oximes. 5,486,521, Cl. 514-274.000.

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Brown, J. Michael, to Betz Laboratories, Inc. Method of inhibiting barium sulfate and strontium sulfate scale at low pH. 5,486,294, Cl. 210-674.000.

Brown, Louis R.; Steffens, Charles E., Jr.; Kosenich, Charles E.; and Robbins, Delmar H., to TRW Vehicle Safety Systems Inc. Method and apparatus for simulating vehicle side impacts. 5,485,758, Cl. 73-865.800.

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Bruker, Izi: *See*—
Le, Thu A.; Bruker, Izi; Lascombe, Brian H.; and Jamiolkowski, Dennis D., 5,486,197, Cl. 606-232.000.

Brumbach, Joseph F., to FibroSonics, Inc. Bubble control device for an ultrasonic surgical probe. 5,486,162, Cl. 604-22.000.

Brunsmann, George A., Jr.: *See*—
Reisenfeller, Paul R.; and Brunsmann, George A., Jr., 5,486,997, Cl. 364-165.000.

Bruno, Michael; and Curran, Andy. Music quiz game for amusement. 5,486,006, Cl. 273-301.000.

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Ray, Billy E.; Cox, Gregg T.; Bryant, Fred D.; Ray, Jimmie A.; Christopher, B. Joe; and Holcombe, Dan C., 5,485,967, Cl. 242-18.00A.

Bryskin, Louis B.; Mower, Samuel R.; and Lord, Peter W., to Space Systems/Loral, Inc. Self-supporting convex cover for spacecraft. 5,486,599, Cl. 428/99.000.

Buchwalter, Richard; Chernova, Nina I.; Ivanchenko, Alexander V.; Loseva, Marina V.; Petrashevich, Olga S.; Pozhidaev, Evgeniy P.; Rabinovich, Arnold Z.; and Schadt, Martin, to Hoffmann-La Roche Inc.; and Nitopic Moscow Research and Production Association. Liquid crystalline mixtures having a chiral tilted smectic phase. 5,486,310, Cl. 252-299.610.

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Buck, Ildiko M.: *See*—
Kalindjian, Sarkis B.; Broughton, Howard B.; Low, Caroline M. R.; McDonald, Iain M.; Hull, Robert A. D.; Shankley, Nigel P.; Buck, Ildiko M.; Steel, Katherine I. M.; and Davies, Jonathan M. R., 5,486,597, Cl. 530-331.000.

Buck Knives, Inc.: *See*—
Sebec, Brett P., 5,483,677, Cl. 30-294.000.

Buckland, Peter E. Hand immobilizing and positioning apparatus for x-ray examinations. 5,485,856, Cl. 128-643.000.

Buckmann, Kenneth R.: *See*—
Park, Chin S.; Holler, Mark A.; Diamond, Jay M.; The, Siang-Chun; Simoni, Umberto; and Buckmann, Kenneth R., 5,487,133, Cl. 395-27.000.

Budai, Zoltán: *See*—
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Buehler AG: *See*—
Hostettler, Rene; and Maechler, Ernst, 5,485,965, Cl. 241-29.000.

Buhler, Michael: *See*—
Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; Van Dyk, Karl; and Jervis, James E., 5,486,183, Cl. 606-127.000.

Buhr, Chris A., to Gilead Sciences, Inc. Oligonucleotide having enhanced binding affinity. 5,486,603, Cl. 536-24.300.

Buhr, Mark S.: *See*—
Webler, William E.; and Buhr, Mark S., 5,485,846, Cl. 128-662.060.

Bulk Handling Systems, Inc.: *See*—
Miller, Roy R.; Clark, Brian K.; and Austin, Fred M., 5,485,925, Cl. 209-615.000.

Bull HN Information Systems Inc.: *See*—
Keeley, James W., 5,487,163, Cl. 395-550.000.

Bull S.A.: *See*—
Urien, Pascal, 5,487,073, Cl. 371-20.600.

Bullivant, Roger A., to Roger Bullivant of Texas, Inc. Method and apparatus for supporting a load. 5,486,071, Cl. 405-229.000.

Bullock, Jonathan S., IV; and Lawson, Roger L., to Martin Marietta Energy Systems, Inc. Process for applying control variables having fractal structures. 5,486,280, Cl. 205-67.000.

Bullock, Ronald E.: *See*—
Ference, Joseph A.; Bullock, Ronald E.; Uhlir, Donald A.; Duhl, Michael L.; and Ropelato, Sam A., 5,486,382, Cl. 427-376.300.

Bundy Corporation: *See*—
Gunderson, Stephen H., 5,485,982, Cl. 251-149.600.
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Bunte, Hans-Jürgen: *See*—
Eichenauer, Herbert; Pisjko, Karl-Erwin; Bunte, Hans-Jürgen; and Thiem, Hans-Jürgen, 5,486,583, Cl. 526-68.000.

Burges, Christopher J.; Le Cun, Yann A.; and Matan, Ofer, to AT&T Corp. Graphical system for automated segmentation and recognition for image recognition systems. 5,487,117, Cl. 382-173.000.

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Murata, Mazahide; and Burkhardt, Terry J., 5,486,585, Cl. 526-130.000.

Burnham, Jeffrey C.; Hageage, George J.; Jamburd-Sweet, Douglas; and Hendricks, Judy, to Medical College of Ohio. Biologically relevant methods for the rapid determination of sterility. 5,486,459, Cl. 435-31.000.

Burns, David W.; and Glenn, Max C., to Honeywell Inc. Piezoresistive silicon pressure sensor implementing long diaphragms with large aspect ratios. 5,485,753, Cl. 73-720.000.

Burns, Donald J.; and Nahmias, A. Michael, to Mobil Oil Corporation. Recyclable blister package. 5,486,390, Cl. 428-40.000.

Burns, Geoffrey; Engel, Wolf-Deiter; and Seidel, Christoph, to Boehringer Mannheim GmbH. Lipoprotein (a) peptides and their use. 5,486,476, Cl. 436-15.000.

Bushman Limited: *See*—
Balcvega, George, 5,485,776, Cl. 89-130.000.

Butcher, Robert A. Portable computer carry case assembly. 5,485,922, Cl. 206-576.000.

Butler, James P.; Fredberg, Jeffrey J.; Ingber, Donald E.; and Wang, Ning, to Children's Medical Center Corporation; and President and Fellows of Harvard College. Method and system for measurement of mechanical properties of molecules and cells. 5,486,457, Cl. 435-7.200.

Buzzeo, Pasquale: *See*—
Heinz, Daniel J.; Lathrop, Gregory A.; Caldwell, Lawrence W.; and Buzzeo, Pasquale, 5,486,152, Cl. 493-468.000.

Byers, Joseph L.: *See*—
Flint, W. Torisan; and Byers, Joseph L., 5,486,402, Cl. 428-141.000.

Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., to Unisys Corporation. System for processing shift, mask, and merge operations in one instruction. 5,487,159, Cl. 395-375.000.

Bylund, Don M.; Willauer, Howard C., Jr.; and Reynolds, James R., to Milliken Research Corporation. Melted and delustered camouflaged fabric. 5,486,385, Cl. 428-17.000.

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Bourne, George; Davis, Randall W.; Duval, George; Goodine, Dennis; Lock, James E.; Ouellette, Gerry; Perry, Stanton B.; Wagner, Maria; and Whitaker, Gregory R., 5,486,193, Cl. 606-194.000.

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Crammond, Patrick J., 5,485,873, Cl. 144-162.00R.

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Salcomon, Mary F.; Davis, Kirk E.; Karn, Jack L.; and Cahoon, John M., 5,486,300, Cl. 252-18.000.

Cain, Ronald A.; Du Lu, Janet A.; and Lemke, Ralph E., to Borland International, Inc. Development system with methods for visual inheritance and improved object reusability. 5,487,141, Cl. 395-135.000.

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Calhoun, Clyde D.: *See*—
Koskenmaki, David C.; and Calhoun, Clyde D., 5,486,427, Cl. 428-546.000.

California Institute of Technology: *See*—
Jones, Jack A.; and Yavrouian, Andre H., 5,485,675, Cl. 29-890.046.
Stalder, Roland E.; Van Zandt, Thomas R.; Hecht, Michael H.; and Grunthaner, Frank J., 5,486,697, Cl. 250-305.000.

California Pellet Mill Company: *See*—
Ettie, Gordon E.; and Wilhelm, Donald M., 5,486,102, Cl. 425-202.000.

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Schmidt, Glenn H.; and Helmstetter, Richard C., 5,485,997, Cl. 273-78.000.

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Broussard, Fabio; Adovasio, Mauro; Callierotti, Corrado; Taroni, Gianbattista; and Roncalli, José, 5,486,613, Cl. 546-181.000.

Camp, Carl E.: *See*—
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Campbell, Paul: *See*—
Randall, Martin; Campbell, Paul; and Gilbert, Douglas J., 5,486,844, Cl. 345-113.000.

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Canfield, Lyle D., to Pacesetter, Inc. Active discharge of a coupling capacitor in an implantable medical device. 5,486,201, Cl. 607-13.000.

Canon Hanbai Kabushiki Kaisha: *See*—
Imai, Hitoshi; Sugiura, Muneharu; and Hoashi, Katsutoshi, 5,486,948, Cl. 359-462.000.

Canon Inc.: *See*—
Long, Timothy, 5,487,020, Cl. 364-571.010.
Melen, Roger D., 5,487,118, Cl. 382-202.000.

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Long, Timothy, 5,487,020, Cl. 364-571.010.

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Arai, Takashi, 5,486,852, Cl. 348-211.000.
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 5,486,848, Cl. 347-15.000.
Fujibayashi, Kazuo, 5,486,894, Cl. 354-446.000.
Hirano, Hirofumi; Hasegawa, Koh; Inoue, Hiroyuki; Bekki, Toshihiko; and Ikado, Masaharu, 5,485,991, Cl. 271-121.000.
Imai, Hitoshi; Sugiura, Muneharu; and Hoashi, Katsutoshi, 5,486,948, Cl. 359-462.000.
Ito, Akira, 5,486,902, Cl. 355-208.000.

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Kenmochi, Toshio; and Kiguchi, Masao, 5,487,106, Cl. 379-100.000.
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Nakagawa, Katsumi; and Toyama, Noboru, 5,486,238, Cl. 136-259.000.
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Oka, Hirotsugu, 5,486,055, Cl. 400-61.000.
Saika, Toshihiro; Mizutani, Hidemasa; Kaifu, Noriyuki; and Kameshima, Toshio, 5,486,738, Cl. 315-169.300.
Sakakibara, Teigo; Sakai, Kiyoshi; Kikuchi, Toshihiro; and Senoo, Akihiro, 5,486,439, Cl. 430-59.000.
Sakurai, Katsuhito, 5,486,875, Cl. 348-642.000.
Suzuki, Kenji; Ishizaki, Akira; Ohtaka, Keiji; Suda, Yasuo; Fukahori, Hidehiko; Nagano, Akihiko; Konishi, Kazuki; and Tsunekawa, Tokuichi, 5,486,892, Cl. 354-402.000.
Takeda, Atsushi; Koike, Michiro; Saito, Hironobu; and Katsumi, Toru, 5,486,905, Cl. 355-215.000.
Tsuji, Toshihiko; Takeuchi, Seiji; Miyazaki, Kyoichi; Yoshii, Minoru; Nose, Noriyuki; and Mori, Tetsuzo, 5,486,919, Cl. 356-349.000.
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Yamaguchi, Yukuo; Onuki, Kazuhiko; and Sugiyama, Kazuhide, 5,486,882, Cl. 353-77.000.

Canstar Sports Group Inc.: *See*—
Olivieri, Icaro, 5,486,012, Cl. 280-11.200.

Capeci, Scott W.; Osborn, James W.; Angell, Adrian J. W.; and van Dijk, Paul, to Procter & Gamble Company, The. Process for making high density detergent agglomerates using an anhydrous powder additive. 5,486,303, Cl. 252-89.100.

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Wise, Frederick M.; and DeWitt, Carl F., 5,486,078, Cl. 410-155.000.

Caplan, Arnold I.; and Haynesworth, Stephen E., to Osiris Therapeutics, Inc. Human mesenchymal stem cells. 5,486,359, Cl. 424-93.700.

Caporiccio, Gerardo: *See*—
Boutevin, Bernard J. L.; Abdellah, Latifa; and Caporiccio, Gerardo, 5,486,422, Cl. 428-447.000.

Capowski, Robert S.: *See*—
Jordan, Richard C.; Capowski, Robert S.; Casper, Daniel F.; Ferraiolo, Frank D.; Laviola, William C.; and Tomaszewski, Peter R., 5,487,095, Cl. 376-371.000.

Capps, Stephen P.; and Gannholm, Martin R., to Apple Computer, Inc. Method and apparatus for setting a clock in a computer system. 5,487,054, Cl. 368-185.000.

Carangelo, Robert M.; Dettori, Mark D.; Grigely, Lawrence J.; Murray, Terence C.; Solomon, Peter R.; Van Dine, C. Peter; and Wright, David D., to On-Line Technologies Inc. Flexture plate motion-transfer mechanism, beam-splitter assembly, and interferometer incorporating the same. 5,486,917, Cl. 356-346.000.

Carden, Robin A., to Alyn Corporation. Metal matrix compositions and method of manufacture thereof. 5,486,223, Cl. 75-244.000.

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Webler, William E.; and Buhr, Mark S., 5,485,846, Cl. 128-662.060.

Cardis, Angeline B.: *See*—
Abramo, Guy P.; Blain, David A.; and Cardis, Angeline B., 5,486,301, Cl. 252-51.50A.

Cardy, Douglas R.: *See*—
Bray, Paul M.; Cardy, Douglas R.; and Shelton, Charles P., 5,487,110, Cl. 379-220.000.

Carl-Zeiss-Stiftung: *See*—
Knupfer, Klaus, 5,486,858, Cl. 348-303.000.

Carlingswitch, Inc.: *See*—
Fasano, Michael, 5,486,660, Cl. 200-43.160.

Carlotta, Michael; Dietl, Steven J.; and Morano, Richard A., to Xerox Corporation. Apparatus for supplying ink to an ink jet printer. 5,486,855, Cl. 347-87.000.

Carlson, William C.; Hartle, Jeffrey E.; and Bower, Barbara K., to Weyerhaeuser Company. Oxygenated analogs of botanic seed. 5,486,218, Cl. 47-57.600.

Carnegie Mellon University: *See*—
Waggoner, Alan S.; Ernst, Lauren A.; and Mujumdar, Ratnakar B., 5,486,616, Cl. 548-217.000.

Carney, Scott N.: *See*—
Kuffner, Stephen L.; Carney, Scott N.; and Krenz, Eric L., 5,486,836, Cl. 343-700.0MS.

Caroline Christ Abgasfreie Werkzeugreinigungsapparate für die Kunststoffindustrie: *See*—
Schmidt, Rudolf, 5,485,858, Cl. 134-107.000.

Caron, Ronald N.; and Breedis, John F., to Olin Corporation. Process for improving the bend formability of copper alloys. 5,486,244, Cl. 148-554.000.

Carpenter, Alton D.; and Segler, Howard W., to Texas Instruments Incorporated. Method for encasing a printed wiring board. 5,485,672, Cl. 29-841.000.

Carpenter, Leslie E., II; and Ekeland, Robert A., to Dow Corning Corporation. Curable silicone coatings containing silicone resins. 5,486,578, Cl. 525-478.000.

Carr, Arthur G.; Durgin, Christopher A.; Griffiths, William D.; and Hill, J. Alexander, to Nomadic Structures, Inc. Carrying case having detachable step stool. 5,486,043, Cl. 312-235.100.

Carrera, George M., Jr.: *See*—
Summers, James B., Jr.; Davidsen, Steven K.; Curtin, Michael L.; Heyman, H. Robin; Sheppard, George S.; Xu, Lianhong; Carrera, George M., Jr.; and Garland, Robert B., 5,486,525, Cl. 514-303.000.

Carroll, Francis C., to EPP, Inc. Chewable animal toy. 5,485,809, Cl. 119-710.000.

Carter, Mark C. Collapsible shelter with elevated canopy. 5,485,863, Cl. 135-145.000.

Carter, Willie J.: *See*—
Norfleet, James; Carter, Willie J.; Frankel, Matthew J.; and Gaffar, Abdul, 5,486,350, Cl. 424-49.000.

Carty, Daniel T.: *See*—
Mitchell, James D.; Alvarez, Vincent E.; Carty, Daniel T.; and Latham, James R., 5,486,212, Cl. 8-142.000.

Carver, Edward L., Jr. Reagent system for improved multiple species blood analysis. 5,486,477, Cl. 436-17.000.

Cary, Gregory E.: *See*—
Killpatrick, Joseph E.; Berndt, Dale F.; Fritze, Keith R.; and Cary, Gregory E., 5,486,920, Cl. 356-350.000.

Casimir-Schenkel, Jutta; Fiechter, Armin; Gysin, Beat; and Zimmermann, Wolfgang, to Clariant Finance (BVI) Limited. Thermostable endoxylanases. 5,486,468, Cl. 435-200.000.

Casio Computer Co., Ltd.: *See*—
Toya, Masumi, 5,487,140, Cl. 395-135.000.

Casper, Daniel F.: *See*—
Jordan, Richard C.; Capowski, Robert S.; Casper, Daniel F.; Ferraiolo, Frank D.; Laviola, William C.; and Tomaszewski, Peter R., 5,487,095, Cl. 376-371.000.

Cassella Aktiengesellschaft: *See*—
Schönafinger, Karl; and Bohn, Helmut, 5,486,531, Cl. 514-364.000.

Castonguay, Roger N.; Rosen, James L.; and Zaffetti, Mark A., to General Electric Company. Rating module unit for high ampere-rated circuit breaker. 5,486,667, Cl. 200-400.000.

Catalytica, Inc.: *See*—
Dalla Betta, Ralph A.; Reed, Daniel L.; and Schubert, Priscilla, 5,486,336, Cl. 422-90.000.

Caterpillar Inc.: *See*—
Kelley, Kurtis C., 5,486,413, Cl. 428-323.000.

Cathey, David A.; Hofmann, James J.; Dynka, Danny; and Stansbury, Darryl M., to Micron Display Technology, Inc. Spacers for large area displays. 5,486,126, Cl. 445-25.000.

Cavaliere, William A.; Kuder, Robert P., II; and Wu, Jin J., to International Business Machines Corporation. Mounting apparatus for cryogenic aerosol cleaning. 5,486,132, Cl. 451-75.000.

Cavazos, Frank G. Modular innerspring and box spring assemblies. 5,485,639, Cl. 5-259.100.

Cavo, Vincent N.: *See*—
Saylor, Charles H. M.; Cavo, Vincent N.; Riccardi, James A., Jr.; and Piszcz, Alan T., 5,487,139, Cl. 395-135.000.

Cawthorne, Chris E.; Peterson, Steve; Kar, Naresh J.; and Keshavan, Madapusi K., to Smith International, Inc. Rock bit. 5,485,890, Cl. 175-228.000.

Cedardell Limited: *See*—
Todd, Robert E., 5,486,812, Cl. 340-539.000.

Celcore, Inc.: *See*—
Fletcher, Anthony G., 5,487,101, Cl. 379-60.000.

Centecor, Inc.: *See*—
Heavner, George A., 5,486,595, Cl. 530-324.000.

Center for Innovative Technology**: *See*—
Hua, Guichao C.; and Lee, Fred C., 5,486,752, Cl. 323-222.000.

Century Products Company: *See*—
Harper, Marge, 5,486,037, Cl. 297-397.000.

Ceramaspeed Limited: *See*—
McWilliams, Joseph A., 5,486,323, Cl. 264-112.000.

Ceskoslovenska akademie ved: *See*—
Procházka, Zdenko; Bláha, Ivo; Žertová, Miroslava; Slaninová, Jiřina; Velek, Jiří; Škopková, Jana; Lebl, Michal; Barth, Tomislav; Maletínská, Lenka; and Vilhardt, Hans, 5,486,596, Cl. 530-329.000.

Cesna, Joseph V.; and Van Woerkom, Anthony G., to Speedfam Corporation. Device for conditioning polishing pads. 5,486,131, Cl. 451-56.000.

Chaiken, Craig L., to Gerber Garment Technology, Inc. Garment marker system having computer assisted alignment of variable contrast cloth designs. 5,487,011, Cl. 364-470.000.

Chait, Abraham I. Non-linting ball gasket for computer mouse devices and method. 5,486,845, Cl. 345-163.000.

Chan, Alexander; and Pan, Yuh-Guo, to Clairol, Inc. Direct dyes having a quaternary center with a long aliphatic chain. 5,486,629, Cl. 552-236.000.

Chan, Daniel S. H.: *See*—
Chim, Wai K.; Phang, Jacob C. H.; and Chan, Daniel S. H., 5,486,769, Cl. 324-751.000.

Chan, Francis H., to International Business Machines Corporation. Transmission line output driver. 5,486,782, Cl. 327-112.000.

Chan, John C.; and Compani, Hossein, to Alcatel Canada Wire Inc. Power cable with longitudinal waterblock elements. 5,486,648, Cl. 174-23.00R.

Chan, Lawrence K. M.: *See*—

Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Samra, Amarjit K., 5,486,309, Cl. 252-299.600.

Chaney, Don: *See—*
Cox, Verlon F.; and Chaney, Don, 5,485,816, Cl. 126-25.00R.

Chaney, Taylor S.: *See—*
Kassatly, Amal A.; Chaney, Taylor S.; and Floss, Peter, 5,487,131, Cl. 395-62.000.

Chang, Dong I.: *See—*
Yang, Chang M.; Hong, Jong Y.; Lee, Ki W.; Lee, Byeong G.; and Chang, Dong I., 5,486,624, Cl. 549-418.000.

Chang, Mike F.: *See—*
Hshieh, Fwu-Iuan; Choi, Calvin K.; Cook, William H.; Ching, Lih-Ying; and Chang, Mike F., 5,486,772, Cl. 324-769.000.

Chang, Shau-Gan: *See—*
Yoder, David; Chang, Shau-Gan; Xu, Ansui; and Domoras, Thomas, 5,486,375, Cl. 426-582.000.

Chang, Tien C.: *See—*
Tsai, Chia S.; and Chang, Tien C., 5,486,266, Cl. 156-657.100.

Chang, Victor S.: *See—*
Schrenk, Walter J.; Wheatley, John A.; and Chang, Victor S., 5,486,949, Cl. 359-498.000.

Chang, Wei-Sun, to Molex Incorporated. Locking system for an electrical connector assembly. 5,486,117, Cl. 439-357.000.

Chang, Yuan F., to Gamemax Corporation. Paper money recognition and transmission system for vending machines. 5,485,907, Cl. 194-203.000.

Charboneau, Thomas J.; Strott, Douglas B.; Sogge, Dale R.; and Maher, Thomas R., to Texas Instruments Incorporated. Pressure transducer apparatus having a rigid member extending between diaphragms. 5,486,976, Cl. 361-283.400.

Chatigny, Joseph V.; Thompson, Mitchell; Radice, Peter F.; and Halvorsen, Donald L., to Whitaker Corporation, The. Traffic sensor having piezoelectric sensors which distinguish lanes. 5,486,820, Cl. 340-933.000.

Chavaillaz, Georges: *See—*
Guyomard, Daniel; Anderson, James L., Jr.; Frank, Alfred; and Chavaillaz, Georges, 5,485,941, Cl. 222-1.000.

Cheil Foods & Chemicals Inc.: *See—*
Lee, Yong W.; Lee, Yeong S.; Yon, Chang S.; Suh, Jung W.; Lee, Chul H.; Lim, Yoong H.; and Yoo, Ick D., 5,486,630, Cl. 554-1.000.

Chemrec Aktiebolag: *See—*
Nilsson, Bengt, 5,486,269, Cl. 162-31.000.

Chen, Chung-Te. Method for cooking food with heat energy generated from natural stone materials. 5,486,371, Cl. 426-510.000.

Chen, Ralph: *See—*
Olson, Todd; Meiser, Dan; Steed, Gary; Huffman, Eric; Otten, Matthew; VanOverloop, Ronald; Powell, Darrel; Knodell, Thomas; Rhad, Edward; Chen, Ralph; and Cook, Robert, 5,485,947, Cl. 227-176.100.

Chen, Teh-Yi J., to North American Philips Corporation. Method of fabrication of protected programmable transistor with reduced parasitic capacitances. 5,486,480, Cl. 437-29.000.

Cheng, Viktor C. H. End user query facility. 5,487,132, Cl. 395-63.000.

Cheon, In K.: *See—*
Choi, Jong D.; Cheon, In K.; Song, Geun H.; and Park, Hee Y., 5,486,958, Cl. 360-85.000.

Cherney, Dale M.; and Hopkins, Keith, to Hayssen Manufacturing Company. Method of handling film on a vertical form, fill and seal machine. 5,485,712, Cl. 53-436.000.

Chernova, Nina I.: *See—*
Buchecker, Richard; Chernova, Nina I.; Ivaschenko, Alexander V.; Loseva, Marina V.; Petrashevich, Olga S.; Pozhidaev, Evgeniy P.; Rabinovich, Arnold Z.; and Schadt, Martin, 5,486,310, Cl. 252-299.610.

Chesebrough-Pond's USA Co.: *See—*
Faryniarz, Joseph R.; and Miner, Philip E., 5,486,305, Cl. 252-162.000.

Chess, Cyrus. Apparatus for treating cutaneous vascular lesions. 5,486,172, Cl. 606-20.000.

Chevroulet, Tristan; and Beroud, Claude, to SMH Management Services AG. Automotive vehicle including a security arrangement provided with an inflatable protective bag. 5,486,019, Cl. 280-730.100.

Chiang, David, to Xilinx, Inc. Antifuse-based programmable logic circuit. 5,486,776, Cl. 326-41.000.

Chiang, Wen-Chang: *See—*
Hsiue, Ging-Ho; Shy, Jow-Tsong; Liang, Jang-Jeng; and Chiang, Wen-Chang, 5,486,311, Cl. 252-299.660.

Chiba-Geigy Corporation: *See—*
Adam, Jean-Marie, 5,486,608, Cl. 544-108.000.

Chiba, Hiroshi: *See—*
Shiokawa, Junji; Chiba, Hiroshi; Murakami, Toshio; Todaka, Yoshihiro; Ohsaka, Ichiro; and Azumi, Takashi, 5,486,860, Cl. 348-354.000.

Chiba, Yoshio: *See—*
Miyata, Hiroshi; Chiba, Yoshio; and Noguchi, Osami, 5,486,671, Cl. 219-76.140.

Children's Medical Center Corporation: *See—*
Butler, James P.; Fredberg, Jeffrey J.; Ingber, Donald E.; and Wang, Ning, 5,486,457, Cl. 435-7.200.
Saunders, Scott; Bernfield, Merton; and Kato, Masato, 5,486,599, Cl. 530-395.000.

Chim, Wai K.; Phang, Jacob C. H.; and Chan, Daniel S. H., to National University of Singapore. Method and apparatus for measuring quantitative voltage contrast. 5,486,769, Cl. 324-751.000.

Chin, Steven S.: *See—*
Himes, Glenn R.; Spence, Bridget A.; Hoxmeier, Ronald J.; and Chin, Steven S., 5,486,574, Cl. 525-314.000.

Ching, Lih-Ying: *See—*
Hshieh, Fwu-Iuan; Choi, Calvin K.; Cook, William H.; Ching, Lih-Ying; and Chang, Mike F., 5,486,772, Cl. 324-769.000.

Chino, Hiroyuki; Akasaka, Toshiya; and Iwata, Minoru, to Ebara Corporation. Easily started DC motor apparatus. 5,486,742, Cl. 318-254.000.

Chiu, Tin-Ho: *See—*
Tang, Regianld T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundanbhai M., 5,486,593, Cl. 528-370.000.

Choi, Bongrak: *See—*
Kim, Heejo; Leem, Jongyong; Choi, Bongrak; Lee, Kyungsang; and Min, Kyungseol, 5,486,726, Cl. 307-120.000.

Choi, Calvin K.: *See—*
Hshieh, Fwu-Iuan; Choi, Calvin K.; Cook, William H.; Ching, Lih-Ying; and Chang, Mike F., 5,486,772, Cl. 324-769.000.

Choi, Jeong D.; Cheon, In K.; Song, Geun H.; and Park, Hee Y., to Goldstar Co., Ltd. Video cassette tape recorder with single loading motor, actuating plate and fast winding plate. 5,486,958, Cl. 360-85.000.

Chorne, Robert. Weighted golf iron club head. 5,486,000, Cl. 273-169.000.

Chou, Marilyn M., to Xintec Corporation. Transparent cap fiber optica laser beam angle delivery device. 5,486,171, Cl. 606-16.000.

Chow, Clarence Y.: *See—*
Gorbell, Brian N.; Wozniczka, Beguslav M.; and Chow, Clarence Y., 5,486,430, Cl. 429-35.000.

Choy, Michael M.; Green, Paul E., Jr.; Hall, William E.; Janniello, Frank J.; Kravitz, Jeff K.; Liu, Karen; Ramaswami, Rajiv; and Tong, Franklin F., to International Business Machines Corporation. Optical wavelength division multiplexer for high speed, protocol-independent serial data sources. 5,487,120, Cl. 385-24.000.

Christopher, B. Joe: *See—*
Ray, Billy E.; Cox, Gregg T.; Bryant, Fred D.; Ray, Jimmie A.; Christopher, B. Joe; and Holcombe, Dan C., 5,485,967, Cl. 242-18.00A.

Chu, Ellen Y.: *See—*
Ford, Jeffrey E.; Chu, Ellen Y.; and Rude, Harold E., 5,486,219, Cl. 51-298.000.

Chu, Gigi C.: *See—*
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.

Chu, Wen-I: *See—*
Shyu, Rong-Fuh; and Chu, Wen-I, 5,486,868, Cl. 348-524.000.

Chung, Ui-Shik, to Daewoo Electronics Co., Ltd. Directional changeover pump. 5,486,089, Cl. 415-146.000.

Church & Dwight Co., Inc.: *See—*
Berschied, John R., Jr., 5,486,355, Cl. 424-65.000.

Chylinski, Kathleen J.: *See—*
Baals, Kimberly A.; Chylinski, Kathleen J.; Kall, Darren A.; and Smith, Gary C., 5,487,104, Cl. 379-96.000.

Ciba-Geigy Corporation: *See—*
Deitz, Rolf; and Tzikas, Athanassios, 5,486,600, Cl. 534-634.000.
Gordon, Julian; Hawkes, Richard; Niday, Evelyn; and Towbin, Harry, 5,486,452, Cl. 435-5.000.
Moser, Peter; Page, Campbell T.; and Püntener, Alois, 5,486,213, Cl. 8-437.000.
Shum, Sai P.; and Pastor, Stephen D., 5,486,641, Cl. 558-78.000.

Circon Corporation: *See—*
Muller, Richard P.; and O'Hare, Richard J., 5,486,155, Cl. 600-137.000.

Citizen Watch Co., Ltd.: *See—*
Kashikie, Junsuke; and Taguchi, Hideo, 5,485,659, Cl. 24-71.00J.

Clairol, Inc.: *See—*
Chan, Alexander; and Pan, Yuh-Guo, 5,486,629, Cl. 552-236.000.
Wenke, Gottfried; Pan, Yuh-Guo; Lim, Mu-Ill; and Stasaitis, Linas, 5,486,619, Cl. 548-508.000.

Clanton, Christopher L.: *See—*
Smolinske, Jeffrey C.; Tran, Phieu M.; Clanton, Christopher L.; and Scheibel, Robert C., Jr., 5,487,068, Cl. 370-94.100.

Clariant Finance (BVI) Limited: *See—*
Casimir-Schenkel, Jutta; Fiechter, Armin; Gysin, Beat; and Zimmermann, Wolfgang, 5,486,468, Cl. 435-200.000.

Clark, Brian K.: *See—*
Miller, Roy R.; Clark, Brian K.; and Austin, Fred M., 5,485,925, Cl. 209-615.000.

Clark, James K.: *See—*
Wagg, Theadore J.; Clark, James K.; and Sporzynski, Robert S., 5,485,678, Cl. 33-610.000.

Clarke, John R.: *See—*
Joye, Donald D.; Mints, William H.; Clarke, John R.; and Wechgelaer, Peter, 5,485,834, Cl. 128-205.130.

Clementini, Luciano; Galambos, Adam F.; Lesca, Giuseppe; Spagnoli, Leonardo; Starsinic, Michael E.; and Ogale, Kumar, to Montell North America Inc. Resilient, high strinkage propylene polymer yarn and articles made therefrom. 5,486,419, Cl. 428-397.000.

Cleveland, Terry R.; Everhart, Cherie H.; Radwanski, Fred R.; and Skoog, Henry, to Kimberly-Clark Corporation. Liquid saturation process. 5,486,381, Cl. 427-294.000.

Clifton, Guy L., to University of Texas Health Science Center Houston. Method of treating a non-penetrating head wound with hypothermia. 5,486,204, Cl. 607-96.000.

Cline, Roger A.: *See—*
Andresen, Bernhard H.; and Cline, Roger A., 5,487,093, Cl. 375-376.000.

Clorox Company, The: *See—*
Feeney, Brian, 5,486,285, Cl. 210-85.000.
Mitchell, James D.; Alvarez, Vincent E.; Carty, Daniel T.; and Latham, James R., 5,486,212, Cl. 8-142.000.

Cobelo, Vincent, to ABC Packaging Machine Corporation. Apparatus and method for lifting and depositing bottles having handles. 5,486,030, Cl. 294-113.000.

Coburn Optical Industries, Inc.: *See—*
Brennan, William D.; Kulan, Stephen; Hyslop, Ronald T.; Ellis, Johnny; Gregory, Ray; Penner, Larry; and Hays, James K., 5,485,771, Cl. 82-1.110.

Coburn, Ronald, to Passive Bullet Traps Limited. Bullet trap. 5,486,008, Cl. 273-410.000.

Cody, Wayne L.: *See—*
Bowers, Cyril Y.; Cody, Wayne L.; Hubbs, John C.; Foster, Charles H.; and Momany, Frank A., 5,486,505, Cl. 514-16.000.

Coffey, John J.: *See—*
Baxter, Larry K.; and Coffey, John J., 5,486,853, Cl. 348-222.000.

Coffin, Louis F., Jr.: *See—*
Schwabe, Robert J.; Eggleston, Michael R.; and Coffin, Louis F., Jr., 5,486,767, Cl. 324-715.000.

Cohen, Robert C.; and Zubok, Rafial, to Implex Corporation. Acetabular cup, method and tool and installing the same. 5,486,181, Cl. 606-91.000.

Cohen, Ronny: *See—*
Greiss, Israel; Cohen, Ronny; and Viner, Omri, 5,487,173, Cl. 395-800.000.

Coin Acceptors, Inc.: *See—*
Wang, Chuanming; and Leibu, Mark H., 5,485,908, Cl. 194-317.000.

Cole, Paul D., to General DataComm, Inc. Convolutional encoders for modems which implement the "Cole code". 5,486,825, Cl. 341-50.000.

Coleman, Edward C.: *See—*
Mason, Charles R.; Nayyar, Dalip K.; and Coleman, Edward C., 5,486,369, Cl. 426-321.000.

Coleman, Patrick L.; Heilmann, Steven M.; Kangas, Steven L.; Rasmussen, Jerald K.; Rolando, Richard J.; and Stahl, Julie B., to Minnesota Mining and Manufacturing Company. Azlactone-functional polymer blends, articles produced therefrom and methods for preparing both. 5,486,358, Cl. 424-78.230.

Colgate-Palmolive Co.: *See—*
Misselyn, Anne-Marie; Mahieu, Marianne; and Erilli, Rita, 5,486,307, Cl. 252-174.240.
Norfleet, James; Carter, Willie J.; Frankel, Matthew J.; and Gaffar, Abdul, 5,486,350, Cl. 424-49.000.

Colleran, Stephen A.; Pawlicki, Jeffrey J.; and Higgins, John O., Jr., to Molex Incorporated. Electrical connector with terminal position assurance device and guide means for a mating connector. 5,486,118, Cl. 439-374.000.

Colley, James D.: *See—*
Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Stohs, Miriam; Colley, James D.; and Hargrove, Oliver W., Jr., 5,486,342, Cl. 423-243.010.

Collier, John P.; Hogle, Richard; Marsh, James G.; and Thomas, Prakash, to BOC Group, Inc., The. Seamless cylinder shell construction. 5,485,736, Cl. 72-47.000.

Collier, William E. Bullet identification. 5,485,789, Cl. 102-501.000.

Collinge, Gary, to Flat Antenna Company Limited. Phase correcting zone plate. 5,486,950, Cl. 359-565.000.

Collins, Michael: *See—*
Drewry, John R.; Collins, Michael; and Korpal, Ashwani K., 5,487,155, Cl. 395-311.000.

Coloplast A/S: *See—*
Samuelsen, Peter B., 5,486,158, Cl. 602-46.000.

Comer, Keith; Elsasser, Gary; and Iwakiri, Takano, to Toshiba America Information Systems, Inc. Intelligent keypad overlay for portable personal computers. 5,486,846, Cl. 345-168.000.

Comins, Daniel L., to North Carolina State University. Method of making asymmetric DE ring intermediates for the synthesis of camptothecin analogs. 5,486,615, Cl. 546-301.000.

Commonwealth Scientific and Industrial Research Organisation: *See—*
O'Sullivan, John D.; Daniels, Graham R.; Percival, Terence M. P.; Ostry, Diethelm I.; and Deane, John F., 5,487,069, Cl. 370-94.300.

Compagnie Generale Des Etablissements Michelin - Michelin et Cie: *See—*
Garmy, Michel; and Ravel, Bernard, 5,486,260, Cl. 156-406.200.

Compani, Hossein: *See—*
Chan, John C.; and Compani, Hossein, 5,486,648, Cl. 174-23.00R.

Compton, Wayne W., to Kim Lighting, Inc. Luminaire with modular louver shields. 5,486,989, Cl. 362-291.000.

Comsat Corporation: *See—*
Bhaskar, B. R. Udaya, 5,487,086, Cl. 375-243.000.

Conair Corporation: *See—*
Santhouse, Daniel; and Taylor, H. Roy, 5,485,829, Cl. 126-409.000.

Conboy, Michael R.: *See—*
Goff, Gerald L.; Smith, Michael D.; and Conboy, Michael R., 5,485,759, Cl. 73-865.900.

Condenser Italiana S.R.L.: *See—*
Locatelli, Vincenzo, 5,485,732, Cl. 62-520.000.

Connell, Mark E.: *See—*
Peterson, Bruce A.; Connell, Mark E.; Bedient, Robert A.; Elsen, Raymond; Hogard, Michael E.; Johnson, Harley D.; Kelly, Thomas D.; Long, Jean M.; Preston, William G., Jr.; and Smejtek, Dalibor J., 5,486,286, Cl. 210-87.000.

Connell, Michael L.: *See—*
Rademaker, Robert A.; Goiffon, John J.; Connell, Michael L.; and Olszewski, Walter K., 5,485,745, Cl. 73-151.000.

Consiglio Nazionale delle Ricerche: *See—*
Alfano, Bruno, 5,486,763, Cl. 324-309.000.

Constant, Jennifer: *See—*
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Samra, Amarjit K., 5,486,309, Cl. 252-299.600.

Contico International, Inc.: *See—*
Foster, Donald D., 5,485,942, Cl. 222-324.000.

Contolini, Robert J.; Mayer, Steven T.; and Tarte, Lisa A., to United States of America, Energy. Removal of field and embedded metal by spin spray etching. 5,486,234, Cl. 216-91.000.

Cook, Robert: *See—*
Olson, Todd; Meiser, Dan; Steed, Gary; Huffman, Eric; Otten, Matthew; VanOverloop, Ronald; Powell, Darrel; Knodell, Thomas; Rhad, Edward; Chen, Ralph; and Cook, Robert, 5,485,947, Cl. 227-176.100.

Cook, William H.: *See—*
Hshieh, Fwu-Iuan; Choi, Calvin K.; Cook, William H.; Ching, Lih-Ying; and Chang, Mike F., 5,486,772, Cl. 324-769.000.

Cooley, Stephen E.: *See—*
Abbott, Thomas A.; Cooley, Stephen E.; and MacDonald, Michael S., 5,486,140, Cl. 454-333.000.

Cooper, J. Carl. Synchronizing signal separating apparatus and method. 5,486,869, Cl. 348-525.000.

Corbeil, Benoit: *See—*
Dionne, Alain; and Corbeil, Benoit, 5,486,027, Cl. 294-51.000.

Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; Descombes, Jean-Jacques; and Millan, Mark, to Adir et Compagnie. Benzospiroalkenes. 5,486,532, Cl. 514-374.000.

Cordier, Maurice; and Veislinger, Bernard, to Sextant Avionique. Lighting module for instruments with a liquid-crystal matrix. 5,486,983, Cl. 362-29.000.

Cordis Corporation: *See—*
Narayanan, Pallassana V., 5,486,357, Cl. 424-78.170.

Cordova, Amado, to Litton Systems, Inc. Sensor coil with thermomechanically-matched spool for fiber optic gyroscope. 5,486,922, Cl. 356-350.000.

Cordsen, Andreas, to Geophysical Exploration & Development Corporation. Three dimensional seismic data acquistion using a repeating offset arrangement of source and receiver lines. 5,487,052, Cl. 367-56.000.

Cornell, Jeffrey L.; and Phlipot, Thomas H., to Progressive Dynamics, Inc. Diffused air heating system. 5,486,205, Cl. 607-104.000.

Corney, Martin, to Hughes Missile Systems Company. Combination explosive primer and electro-explosive device. 5,485,788, Cl. 102-472.000.

Corso, Ronald, to Amax Coal West, Inc. Process stabilizing process controller. 5,486,998, Cl. 364-152.000.

Cossock, David, to Amdahl Corporation. Computer with two-dimensional merge tournament sort using offset-value coding. 5,487,166, Cl. 395-600.000.

Couch, Charlene R.: *See—*
Miller, Richard E.; Couch, Charlene R.; and Krieger, Cheryl D., 5,486,228, Cl. 106-22.00B.

Coury, William S.: *See—*
Myers, Gene; and Coury, William S., 5,486,195, Cl. 606-213.000.

Cowley, Richard C., to Barwell International Limited. Hydraulic ram operated extruders. 5,486,104, Cl. 425-142.000.

Cox, Gregg T.: *See—*
Ray, Billy E.; Cox, Gregg T.; Bryant, Fred D.; Ray, Jimmie A.; Christopher, B. Joe; and Holcombe, Dan C., 5,485,967, Cl. 242-18.00A.

Cox, Verlon F.; and Chaney, Don. Charcoal burning cooking device. 5,485,816, Cl. 126-25.00R.

CPI Engineering Services, Inc.: *See—*
Short, Glenn D., 5,486,302, Cl. 252-56.00S.

Crabtree Electrical Industries Limited: *See—*
Bowen, Peter W.; and Shotter, Darren J., 5,486,979, Cl. 361-640.000.

Cradeur, Robert R., to Serv-Tech, Inc. Remotely controlled chopping machine for tank cleaning. 5,485,966, Cl. 241-39.000.

Craft, Charles W.: *See—*
Sharrah, Raymond L.; and Craft, Charles W., 5,486,432, Cl. 429-99.000.

Crammond, Patrick J., to CAE Machinery Ltd. Knife clamping system. 5,485,873, Cl. 144-162.00R.

Crane & Co., Inc.: *See—*
Crane, Timothy T., 5,486,022, Cl. 283-83.000.

Crane, Timothy T., to Crane & Co., Inc. Security threads having at least two security detection features and security papers employing same. 5,486,022, Cl. 283-83.000.

Crawford, Donald L.: *See—*
Paszczynski, Andrzej; Goszczynski, Stefan; Crawford, Ronald L.; Crawford, Donald L.; and Pasti, Maria B., 5,486,214, Cl. 8-524.000.

Crawford, Ronald L.: *See—*
Paszczynski, Andrzej; Goszczynski, Stefan; Crawford, Ronald L.; Crawford, Donald L.; and Pasti, Maria B., 5,486,214, Cl. 8-524.000.

Cray Research, Inc.: *See*—
Sullivan, Patrick, 5,487,074, Cl. 371-22.300.
Creative Integrated Systems, Inc.: *See*—
Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; Kojima, Shin-ichi; Minney, Jack L.; Oishi, Motohiro; Fukumura, Keiji; and Nakanishi, H., 5,487,038, Cl. 365-191.000.
Creed, Kevin; and Gilbert, Klay, to Weber Aircraft, Inc. Plastic bottom diaphragm for aircraft seat. 5,485,976, Cl. 244-118.600.
Crepin, Christophe: *See*—
Romanek, Christian; and Crepin, Christophe, 5,485,871, Cl. 141-312.000.
Cringle, Robert J.: *See*—
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.
Crivello, James V., to Rensselaer Polytechnic Institute. Process for making propenyl ethers and photopolymerizable compositions containing them. 5,486,545, Cl. 522-31.000.
Crooymans, Rene W. Shelving support system. 5,485,933, Cl. 211-90.000.
Cross, Peter E.: *See*—
Alker, David; and Cross, Peter E., 5,486,527, Cl. 514-321.000.
Croucher, Russell L.: *See*—
Dailey, Timothy E.; Dissosway, Marc A.; and Croucher, Russell L., 5,487,181, Cl. 455-89.000.
Crowell, Anthony D. Vehicle desk. 5,485,793, Cl. 108-44.000.
Cruden, Andrew J.; McDonald, James R.; Andonovic, Ivan; Allan, Kenneth; and Porrelli, Raymond A., to Instrument Transformers Limited. Electric current measurement. 5,486,754, Cl. 324-96.000.
Curatolo, Benedict S.; Li, George S.; and Giddings, Brandford E., to Standard Oil Company, The. Nonwoven fabrics from high nitrile copolymers. 5,486,409, Cl. 428-221.000.
Curran, Andy: *See*—
Bruno, Michael; and Curran, Andy, 5,486,006, Cl. 273-301.000.
Curran, Timothy T.: *See*—
Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Curran, Timothy T.; and Johnston, J. O'Neal, 5,486,511, Cl. 514-178.000.
Curtin, Michael L.: *See*—
Summers, James B., Jr.; Davidsen, Steven K.; Curtin, Michael L.; Heyman, H. Robin; Sheppard, George S.; Xu, Lianhong; Carrera, George M., Jr.; and Garland, Robert B., 5,486,525, Cl. 514-303.000.
Cydec S.A.: *See*—
Guyomard, Daniel; Anderson, James L., Jr.; Frank, Alfred; and Chavaillaz, Georges, 5,485,941, Cl. 222-1.000.
Cyrix Corporation: *See*—
Eitrheim, John D., 5,486,779, Cl. 327-51.000.
Daewoo Electronics Co., Ltd.: *See*—
Ahn, Seong-Ick, 5,486,966, Cl. 360-107.000.
Chung, Ui-Shik, 5,486,089, Cl. 415-146.000.
Hwang, Jin, 5,486,881, Cl. 353-34.000.
Dagnac, Pierre; Leviandier, Michel; and Tigneres, Jean-Philippe, to Thomson-CSF. Device for heating up electronic boards. 5,486,681, Cl. 219-400.000.
Dahl, Ernest A.: *See*—
Wehrle, John P.; Dahl, Ernest A.; and Lugar, James R., 5,486,811, Cl. 340-522.000.
Dahlberg, Sven G. B., to Aktiebolaget Electrolux. Arrangement in an internal combustion engine. 5,485,817, Cl. 123-198.00E.
Dailey, Timothy E.; Dissosway, Marc A.; and Croucher, Russell L., to Ericsson GE Mobile Communications Inc. Low power architecture for portable and mobile two-way radios. 5,487,181, Cl. 455-89.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Shinbara, Kaoru; Kurata, Yasuhiro; and Sawamura, Masashi, 5,485,644, Cl. 15-21.100.
Daiwa Seiko, Inc.: *See*—
Saito, Masaji; and Yamaguchi, Akira, 5,485,903, Cl. 192-8.00R.
Yamaguchi, Nobuyuki, 5,485,969, Cl. 242-247.000.
Dalke, Donell R. Rocker apparatus. 5,486,034, Cl. 297-272.100.
Dalla Betta, Ralph A.; Reed, Daniel L.; and Schubert, Priscilla, to Catalytica, Inc. NOX sensor assembly. 5,486,336, Cl. 422-90.000.
Dallas Semiconductor Corporation: *See*—
Lee, Robert D., 5,487,037, Cl. 365-189.110.
Pearson, Ronald W.; Deierling, Kevin E.; and Williams, Clark R., 5,487,096, Cl. 377-15.000.
Dallman, Jimmie J. Flail cutter and method of providing a flail cutter for a brush cutting machine. 5,485,718, Cl. 56-294.000.
Dalrymple, Alan W.: *See*—
Brouwer, Walter G.; Dalrymple, Alan W.; Felauer, Ethel E.; and McDonald, Paul T., 5,486,521, Cl. 514-274.000.
Damewood, John R.: *See*—
Kerr, Richard C.; Damewood, John R.; Menzel, Jill; Thottathil, Paul; and Sanduja, Mohan L., 5,486,210, Cl. 8-115.660.
Damilo, Serge: *See*—
Hanak, Karl; Prudhon, Daniel; Damilo, Serge; and Rofidal, Patrick, 5,486,654, Cl. 174-113.00R.
Dan Science Co., Ltd.: *See*—
Hiratsuka, Yutaka; and Akiyama, Tadashi, 5,485,861, Cl. 134-182.000.
Dana Corporation: *See*—
Easley, Paul D., 5,486,757, Cl. 324-174.000.
Daniels, Graham R.: *See*—
O'Sullivan, John D.; Daniels, Graham R.; Percival, Terence M. P.; Ostry, Diethelm I.; and Deane, John F., 5,487,069, Cl. 370-94.300.
Danon, Joseph. Point of purchase dispenser. 5,485,929, Cl. 211-57.100.
Darke, Paul L.; Hall, Dawn L.; and Kuo, Lawrence C., to Merck & Co., Inc. Purified herpes simplex virus protease and methods of purification. 5,486,470, Cl. 435-219.000.
Darlington, William H.: *See*—
Lin, Chiu-Hong; Haadsma-Svensson, Susanne R.; McCall, Robert B.; Romero, Arthur G.; Darlington, William H.; and Ennis, Michael D., 5,486,611, Cl. 546-62.000.
Dasher, James F., to Whirlpool Corporation. Shelf ladder reinforcement member for a refrigeration appliance. 5,486,045, Cl. 312-406.000.
Datta, Madhav; and Shenoy, Ravindra, to IBM Corporation. Electroetching process for seed layer removal in electrochemical fabrication of wafers. 5,486,282, Cl. 205-123.000.
Dautremont-Smith, William C.; Graebner, John E.; Jin, Sungho; and Katz, Avishay, to AT&T Bell Laboratories. Etching a diamond body with a molten or partially molten metal. 5,486,263, Cl. 216-33.000.
Davenport, Roger A., to Motorola, Inc. Surface acoustic wave device. 5,486,800, Cl. 333-193.000.
Davidsen, Steven K.: *See*—
Summers, James B., Jr.; Davidsen, Steven K.; Curtin, Michael L.; Heyman, H. Robin; Sheppard, George S.; Xu, Lianhong; Carrera, George M., Jr.; and Garland, Robert B., 5,486,525, Cl. 514-303.000.
Davies, Jonathan M. R.: *See*—
Kalindjian, Sarkis B.; Broughton, Howard B.; Low, Caroline M. R.; McDonald, Iain M.; Hull, Robert A. D.; Shankley, Nigel P.; Buck, Ildiko M.; Steel, Katherine I. M.; and Davies, Jonathan M. R., 5,486,597, Cl. 530-331.000.
Davies, Mary E.; Whittle, Mavis E.; Jones, William; and Mokaya, Robert, to Laporte Industries Limited. Pillared clays. 5,486,499, Cl. 502-81.000.
Davis, James A.: *See*—
Valaitis, Joseph K.; Davis, James A.; and Lohr, Frederick, 5,486,249, Cl. 156-71.000.
Davis, Kirk E.: *See*—
Salomon, Mary F.; Davis, Kirk E.; Karn, Jack L.; and Cahoon, John M., 5,486,300, Cl. 252-18.000.
Davis, Randall W.: *See*—
Bourne, George; Davis, Randall W.; Duval, George; Goodine, Dennis; Lock, James E.; Ouellette, Gerry; Perry, Stanton B.; Wagner, Maria; and Whittaker, Gregory R., 5,486,193, Cl. 606-194.000.
Davis, Robert A.: *See*—
Mishra, Anupama; and Davis, Robert A., 5,486,533, Cl. 514-383.000.
Davis, William S., Jr.; and Morrow, Julia A., to Davoil, Inc. Ceiling fan blade mounting bracket and support arms providing two fan blade support points. 5,486,094, Cl. 416-210.00R.
Davoil, Inc.: *See*—
Davis, William S., Jr.; and Morrow, Julia A., 5,486,094, Cl. 416-210.00R.
Dawn Equipment Company: *See*—
Bassett, James H., 5,485,796, Cl. 111-33.000.
Bassett, James H., 5,485,886, Cl. 172-763.000.
Day, Michael J.: *See*—
Gardner, Frederick J.; Day, Michael J.; Brandon, Nigel P.; and Brownell, John B., 5,486,428, Cl. 429-19.000.
Dayco Products, Inc.: *See*—
Sanders, John D.; Holden, Homer N.; and Foster, Randy C., 5,486,023, Cl. 285-258.000.
Dayton Laboratories, Inc.: *See*—
Farinas, Reynaldo G., 5,486,537, Cl. 514-462.000.
Deak, Frederick R.: *See*—
Volz, Keith L.; Renn, Robert M.; Iribeck, Robert D.; Deak, Frederick R.; and Johnson, David C., 5,486,771, Cl. 324-755.000.
Dean, Carl A. Collating structure. 5,485,916, Cl. 206-215.000.
Deane, John F.: *See*—
O'Sullivan, John D.; Daniels, Graham R.; Percival, Terence M. P.; Ostry, Diethelm I.; and Deane, John F., 5,487,069, Cl. 370-94.300.
Deaner, Michael J.; Puppin, Giuseppe; and Heikkila, Kurt E., to Andersen Corporation. Advanced polymer/wood composite structural member. 5,486,553, Cl. 524-13.000.
de Boer, Rudolf; Kramer, Roland K.; and McKernan, Ronald W., to DMV USA, Inc. Production of a cultured yeast product from whey permeate, yeast cream and yeast centrate. 5,486,368, Cl. 426-41.000.
Decker, Gary T.: *See*—
Bank, Howard M.; and Decker, Gary T., 5,486,637, Cl. 556-479.000.
Decreamer, Alain, to U.S. Philips Corporation. Apparatus for the display of pictures having an aspect ratio 4/3 on a display having an aspect ratio of 16/9. 5,486,870, Cl. 348-556.000.
Deere & Company: *See*—
Green, Lawrence D.; and Pratt, Ronald L., 5,485,797, Cl. 111-200.000.
Defossez, Béatrice; and Rossignol, Sylvie, to L'Oreal. Cosmetic make-up composition containing a transparent titanium oxide and silicon oxide pigment. 5,486,354, Cl. 424-63.000.
Degnan, Thomas F.; Helton, Terry E.; and Lissy, Daria N., to Mobil Oil Corporation. Catalytic cracking with MCM-49. 5,486,284, Cl. 208-120.000.
Deierling, Kevin E.: *See*—
Pearson, Ronald W.; Deierling, Kevin E.; and Williams, Clark R., 5,487,096, Cl. 377-15.000.
Deinhardt, Günther: *See*—

Meiler, Werner; and Deinhardt, Günther, 5,486,116, Cl. 439-347.000.
Deitz, Rolf; and Tzikas, Athanassios, to Ciba-Geigy Corporation. Fiber-reactive halotriazinyl or halopyrimidinyl disazo dyes. 5,486,600, Cl. 534-634.000.
De Jong, Krijn P.; Lednor, Peter W.; Oud, Anna E. M.; Schoonebeek, Ronald J.; Vonkeman, Koert A.; and Van Der Zwet, Gerardus P., to Shell Oil Company. Process for the preparation of carbon monoxide and/or hydrogen. 5,486,313, Cl. 252-373.000.
Delaunay, Christophe: *See—*
Naka, Shigehisa; Khan, Tasadduq; Walder, André; Marty, Michel; Delaunay, Christophe; and Thevenin, Pierre, 5,486,242, Cl. 148-422.000.
Delco Electronics Corporation: *See—*
Borrego, Diego A.; Greenland, Alan R.; Allison, Charles R.; Bordo, Robert A.; and Stringfellow, Steven A., 5,486,840, Cl. 345-7.000.
Fowble, Juliana V., 5,487,123, Cl. 385-70.000.
Lippmann, Raymond; Schnars, Michael J.; Nelson, James E.; Brouwer, Ivan R.; and Pachciarz, Mahlon R., 5,485,740, Cl. 73-1.00J.
Dell USA, L.P.: *See—*
Bell, James S.; Herman, Patricia L.; and Phillips, Richard I., 5,486,657, Cl. 174-261.000.
della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., to Biosource Technologies, Inc. Method for making stable, extracellular tyrosinase and synthesis of polyphenolic polymers therefrom. 5,486,351, Cl. 424-59.000.
Dellekoenig, Norbert: *See—*
Heisler, William A.; Shipman, David A.; Stachowiak, Anthony A.; Bodden, Kurt S.; Wurth, Michael E.; and Dellekoenig, Norbert, 5,486,042, Cl. 312-196.000.
De Lu, Janet A.: *See—*
Cain, Ronald A.; De Lu, Janet A.; and Lemke, Ralph E., 5,487,141, Cl. 395-135.000.
DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Swenson, Rolf E., to Wisconsin Alumni Research Foundation. Synthesis of 19-nor vitamin D compounds. 5,486,636, Cl. 556-443.000.
Demarest, David; Duncan, Robert B.; and Rattan, William, to Ethicon, Inc. Needle and suture swaging method. 5,485,668, Cl. 29-517.000.
Dempster Industries, Inc.: *See—*
Shirk, Thomas N., 5,485,865, Cl. 137-209.000.
Denison Hydraulics Inc.: *See—*
Schaffner, Larey D., 5,486,097, Cl. 417-222.100.
Denlinger, Edgar J.: *See—*
Rodeffer, Charles E.; Denlinger, Edgar J.; and Fathy, Aly E., 5,486,839, Cl. 343-786.000.
Denny, Martin L., to Dico, Inc. Brake lockout device. 5,485,900, Cl. 188-112.00R.
Denove, Thomas F.; and Blowers, William L., to GDB Enterprises, Inc. LCD bargraph motion picture light meter. 5,486,914, Cl. 356-221.000.
Derks, Irvin L., to Bard Manufacturing Company. Modular air conditioning system. 5,485,878, Cl. 165-16.000.
Descombes, Jean-Jacques: *See—*
Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; Descombes, Jean-Jacques; and Millan, Mark, 5,486,532, Cl. 514-374.000.
De Subijana, Joseba M.: *See—*
Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., 5,487,159, Cl. 395-375.000.
Dettori, Mark D.: *See—*
Carangelo, Robert M.; Dettori, Mark D.; Grigely, Lawrence J.; Murray, Terence C.; Solomon, Peter R.; Van Dine, C. Peter; and Wright, David D., 5,486,917, Cl. 356-346.000.
De Vaan, Adrianus J. S. M., to U.S. Philips Corporation. Reflecting image projection screen and image projection system comprising such a screen. 5,486,884, Cl. 353-122.000.
Devitrysmith, Terry J. Guitar string installation and adjustment mechanism. 5,485,773, Cl. 84-267.000.
Devore, David D.; Timmers, Francis J.; Stevens, James C.; and Rosen, Robert K., to Dow Chemical Company, The. Group 4 metal diene complexes and addition polymerization catalysts therefrom. 5,486,632, Cl. 556-11.000.
DeWitt, Carl F.: *See—*
Wise, Frederick M.; and DeWitt, Carl F., 5,486,078, Cl. 410-155.000.
Dexide, Inc.: *See—*
Freitas, Michael W.; and Miller, Wayne D., 5,486,185, Cl. 606-142.000.
Dexter Shoe Company: *See—*
Beenfeldt, Eric; and Eason, Richard O., 5,485,643, Cl. 12-85.000.
Diamond, Jay M.: *See—*
Park, Chin S.; Holler, Mark A.; Diamond, Jay M.; The, Siang-Chun; Santoni, Umberto; and Buckmann, Kenneth R., 5,487,133, Cl. 395-27.000.
Diamond Semiconductor Group, Inc.: *See—*
Sieradzki, Manny, 5,486,080, Cl. 414-217.000.
DiBenedetto, Anthony. Dynamic multi-angular ankle and foot orthosis device. 5,486,157, Cl. 602-27.000.
Dickerson, Devere C., to Mascotech Tubular Products, Inc. Apparatus for hydroforming a vehicle manifold. 5,485,737, Cl. 72-57.000.
Dickinson, Norman L., to EnerTech Environmental, Inc. Efficient utilization of chlorine and moisture-containing fuels. 5,485,728, Cl. 60-648.000.
Dico, Inc.: *See—*
Denny, Martin L., 5,485,900, Cl. 188-112.00R.
Dienes, Geza, to Andrew Corporation. Broadband omnidirectional microwave antenna for minimizing radiation toward the upper hemisphere. 5,486,838, Cl. 343-781.00R.
Dierdorf, Hans-Rolf, to Henkel Kommanditgesellschaft auf Aktion. Socket for connecting pipe ends by injection of adhesive. 5,486,024, Cl. 285-294.000.
Dieterle, Gerhard, to Erwin Sick GmbH Optik–Eletronik. Monitoring apparatus in machines. 5,486,691, Cl. 250-221.000.
Dietl, Steven J.: *See—*
Carlotta, Michael; Dietl, Steven J.; and Morano, Richard A., 5,486,855, Cl. 347-87.000.
Dietz, Henry G. Breath exposure synchronizer. 5,485,833, Cl. 128-204.230.
Dietz, Henry G. Monitor of low pressure intervals with control capabilities. 5,485,850, Cl. 128-716.000.
Dietz, Terry L.; and Vanlaningham, Richard D., to Zimmer, Inc. Apparatus for milling bone. 5,486,180, Cl. 606-87.000.
Different Dimensions Inc.: *See—*
Zuckerman, Andrew M., 5,485,943, Cl. 223-85.000.
Digital Equipment Corporation: *See—*
Kassatly, Amal A.; Chaney, Taylor S.; and Floss, Peter, 5,487,131, Cl. 395-62.000.
Romm, Michael; Barker, Robert A.; and Morgan, Stuart K., 5,485,932, Cl. 211-87.000.
Diller, Robert W.; and Pavlat, Jeffrey W., to Amerigon, Inc. Energy management system for vehicles having limited energy storage. 5,487,002, Cl. 364-424.010.
Dillner, Joakim; Lerner, Richard A.; Smith, Richard; and Parks, D. Elliot, to Scripps Research Institute, The. Antibodies to human papillomavirus latent proteins, diagnostic systems and methods. 5,486,453, Cl. 435-5.000.
Dimock, Andrew G.: *See—*
Kundert, James W., 5,485,926, Cl. 211-40.000.
Dinallo, Chris A.; Koval, Michael J.; Lawton, William W.; Paulat, Martin J., Jr.; Tyler, John G.; Winters, Scott L.; and Allran, Gary G., to International Business Machines Corporation. Personal computer with generalized data streaming apparatus for multimedia devices. 5,487,167, Cl. 395-650.000.
Dinh, Khanh. Magnetless speaker. 5,487,114, Cl. 381-192.000.
Dinkel, Dieter: *See—*
Beck, Erhard; and Dinkel, Dieter, 5,486,040, Cl. 303-113.200.
Dionne, Alain; and Corbeil, Benoit. Combined traction mat, shovel and utility device. 5,486,027, Cl. 294-51.000.
Display Systems, Inc.: *See—*
Holztrager, William J., 5,485,934, Cl. 211-194.000.
Dissosway, Marc A.: *See—*
Dailey, Timothy E.; Dissosway, Marc A.; and Croucher, Russell L., 5,487,181, Cl. 455-89.000.
Distribution Control Systems, Inc.: *See—*
Mak, Sioe T., 5,486,805, Cl. 340-310.060.
DMV USA, Inc.: *See—*
de Boer, Rudolf; Kramer, Roland K.; and McKernan, Ronald W., 5,486,368, Cl. 426-41.000.
Doan, Trung T.: *See—*
Sandhu, Gurtej S.; and Doan, Trung T., 5,486,129, Cl. 451-5.000.
Dobbs, John; and Banks, David, to Analogic Corporation. Modular detector arrangement for X-ray tomographic system. 5,487,098, Cl. 378-19.000.
Dodds, W. Jean. Oven with food presence indicator. 5,486,685, Cl. 219-720.000.
Dodt, William C.; Gottehrer, Terry R.; and Milligan, Charles A., to Storage Technology Corporation. System for reading and stopping reading data from magnetic tape into memory in response to mount command and write command respectively from the system processor. 5,487,171, Cl. 395-840.000.
Doell, Andreas: *See—*
Thiel, Rudolf; Klimt, Ulrich; and Doell, Andreas, 5,485,899, Cl. 188-73.100.
Dohi, Hikoo, to Yazaki Corporation. Crimp-style terminal. 5,486,653, Cl. 174-84.00C.
Doleshal, David: *See—*
Mark, Steven D.; and Doleshal, David, 5,487,113, Cl. 381-17.000.
Domb, Abraham J.; and Nudelman, Raphael, to Hebrew University of Jerusalem, Yissum Research Development Co. of the. Biopolymers derived from hydrolyzable diacid fats. 5,486,591, Cl. 528-272.000.
Dombrowski, Adrian T.: *See—*
Drake, Charles S.; Williams, Bernhard O.; Dombrowski, Adrian T.; and Harth, Athur R., 5,487,010, Cl. 364-479.000.
Domenig, Georg, to Grass America, Inc. Hinge for mounting a door on a frame. 5,485,656, Cl. 16-387.000.
Domoras, Thomas: *See—*
Yoder, David; Chang, Shau-Gan; Xu, Ansui; and Domoras, Thomas, 5,486,375, Cl. 426-582.000.
Domtar Inc.: *See—*
Nguyen, Xuan T., 5,486,268, Cl. 162-13.000.
Dorset, Andrew; and Paquatte, Olivier, to Procter & Gamble Company, The. Process for making detergent granules by neutralization of sulphonic acids. 5,486,317, Cl. 252-549.000.
Dotzer, Peter: *See—*
Oestreich, Ulrich; Dotzer, Peter; and Unterberger, Siegfried, 5,486,378, Cl. 427-163.200.
Doublet, Pierre; Passebecq, Claude; and Bigot, Etienne, to Arjo Wiggins S.A. Method for manufactuing a stamp to emboss wire cloths in order to make watermarks and equipment to implement this method. 5,486,928, Cl. 358-299.000.

Doucet, Louis J.: *See—*
Albert, Kevin F.; Doucet, Louis J.; and McKrell, Richard L., 5,485,992, Cl. 271-299.000.
Douseki, Takakuni; Yamada, Junzo; Matsuya, Yasuyuki; and Mutou, Shin-ichirou, to Nippon Telegraph and Telephone Corporation. CMOS logic circuits having low and high-threshold voltage transistors. 5,486,774, Cl. 326-33.000.
Dovan, Hoai T.: *See—*
Sandiford, Burton B.; Dovan, Hoai T.; and Hutchins, Richard D., 5,486,312, Cl. 252-315.100.
Dow Benelux N.V.: *See—*
Krist, Johannes H. A.; Lapère, Martine R.; Wassink, Steven G.; and Koolen, Johannes L. A., 5,486,995, Cl. 364-149.000.
Dow Chemical Company, The: *See—*
Devore, David D.; Timmers, Francis J.; Stevens, James C.; and Rosen, Robert K., 5,486,632, Cl. 556-11.000.
Farah, Hani; and Bales, Stephen E., 5,486,577, Cl. 525-469.000.
Newsham, Mark D.; Earls, Jimmy D.; and Hefner, Robert E., Jr., 5,486,580, Cl. 525-504.000.
Quarderer, George J., Jr.; Swisher, Curtis N.; and Trent, David L., 5,486,627, Cl. 549-521.000.
Schrenk, Walter J.; Wheatley, John A.; and Chang, Victor S., 5,486,949, Cl. 359-498.000.
Westlake, Theodore N., III; and Wolcott, Duane K., 5,486,330, Cl. 264-291.000.
Dow Corning Asia, Ltd: *See—*
Fuwa, Yoshio; Saitou, Kouji; and Yamashita, Jiro, 5,486,299, Cl. 252-12.000.
Dow Corning Corporation: *See—*
Bank, Howard M.; and Decker, Gary T., 5,486,637, Cl. 556-479.000.
Boutevin, Bernard J. L.; Abdellah, Latifa; and Caporiccio, Gerardo, 5,486,422, Cl. 428-447.000.
Cabasso, Israel; and Graiver, Daniel, 5,486,590, Cl. 528-23.000.
Carpenter, Leslie E., II; and Ekeland, Robert A., 5,486,578, Cl. 525-478.000.
Gentle, Theresa E.; and Lutz, Michael A., 5,486,565, Cl. 524-730.000.
Katsoulis, Dimitris E., 5,486,566, Cl. 524-773.000.
Polmanteer, Keith E., 5,486,551, Cl. 523-212.000.
Dow Corning, S.A.: *See—*
L'Hostis, Jacqueline; Renauld, Franck A. D.; and Sawicki, George C., 5,486,306, Cl. 252-174.150.
Dow Corning Toray Silicone Company, Ltd.: *See—*
Aso, Takayuki; Ona, Isao; and Ozaki, Masaru, 5,486,298, Cl. 252-8.600.
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Mine, Katsutoshi; Nakamura, Takashi; and Sasaki, Motoshi, 5,486,564, Cl. 524-588.000.
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Okawa, Tadashi, 5,486,635, Cl. 556-437.000.
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Edie, Ronnie G.; Hackler, Ronald E.; and Krumkalns, Eriks V., 5,486,516, Cl. 514-232.800.
Downing, Dennis M.; Glase, Shelly A.; Johnson, Stephen J.; Wise, Lawrence D.; and Wright, Jonathan L., to Warner-Lambert Company. Benzimidazoles and imidazopyridines as central nervous system agents. 5,486,517, Cl. 514-253.000.
Dr. Johannes Heidenhain GmbH: *See—*
Nelle, Günther, 5,485,680, Cl. 33-705.000.
Drab, John J.; and Ramer, O. Glenn, to Hughes Aircraft Company. Ferroelectric interruptible read memory. 5,487,030, Cl. 365-145.000.
Drach, William C.; Babbitt, Richard W.; and Koscica, Thomas E., to United States of America, Army. Low cost automated system for evaluating the electrical characteristics of ferroelectric materials. 5,487,014, Cl. 364-481.000.
Drach, William C.: *See—*
Koscica, Thomas E.; and Drach, William C., 5,486,992, Cl. 363-21.000.
Draghetti, Fiorenzo, to G.D Societa' Per Azioni. Device for feeding reels on to a user machine. 5,486,081, Cl. 414-225.000.
Dragoo, Jerry L.; Bogdanski, Michael S.; Ahr, Nicholas A.; and Noel, John R., to Procter & Gamble Company, The. Absorbent article having blended multi-layer absorbent structure with improved integrity. 5,486,167, Cl. 604-384.000.
Drake, Charles S.; Williams, Bernhard O.; Dombrowski, Adrian T.; and Harth, Athur R., to B.M.D., Inc. Bumper sticker printing machine. 5,487,010, Cl. 364-479.000.
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Holdsworth, David W.; Drangova, Maria; and Fenster, Aaron, 5,485,831, Cl. 128-654.000.
Draper, Donald A.: *See—*
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Drenker, Alexander J.: *See—*
Maischner, Dora; Drenker, Alexander J.; Abels, Peter; and Beyer, Eckhard, 5,486,677, Cl. 219-121.830.
Drewry, John R.; Collins, Michael; and Korpal, Ashwani K., to International Computers Limited. Data switch with multiplexers for forming data connections and control unit for checking permissibility of connections. 5,487,155, Cl. 395-311.000.
Dri-Air Industries, Inc.: *See—*
Sears, Charles F., Jr., 5,485,686, Cl. 34-473.000.
Droho, Joseph S., to Philips Electronics North America Corporation. Method of making an electrical coil. 5,485,669, Cl. 29-605.000.
DSC Communications Corporation: *See—*
Bray, Paul M.; Cardy, Douglas R.; and Shelton, Charles P., 5,487,110, Cl. 379-220.000.
DSP Group, The: *See—*
Paiss, Omri; Shallom, Ilan D.; Flomen, Felix; and Haimi-Cohen, Raziel, 5,487,129, Cl. 395-2.420.
Du Pont de Nemours, E. I., and Company: *See—*
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Ducklow, Diane K.: *See—*
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Duhl, Michael L.: *See—*
Ference, Joseph A.; Bullock, Ronald E.; Uhlir, Donald A.; Duhl, Michael L.; and Ropelato, Sam A., 5,486,382, Cl. 427-376.300.
Duke, Steven R.; Rossier, Glenn E.; and Saganich, Richard P., to United States of America, Air Force. Gun gas control system for multi-barrel weapons. 5,485,775, Cl. 89-14.300.
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Xu, Feng J.; Yu, Yin H.; and Bast, Robert C., Jr., 5,486,456, Cl. 435-7.230.
Dulaney, Donald C. Water repellent solution for wood and method. 5,486,231, Cl. 106-243.000.
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Demarest, David; Duncan, Robert B.; and Rattan, William, 5,485,668, Cl. 29-517.000.
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Dunn, Michael, to Meditech, Ltd. Method for treating cardiac inotropic irregularities. 5,486,506, Cl. 514-26.000.
Durant, Graham J.; Khan, Amin M.; and Tedford, Clark E., to University of Toledo, The; and Gliatech, Inc. Histamine H_2-receptor antagonists and therapeutic uses thereof. 5,486,526, Cl. 514-319.000.
Durgin, Christopher A.: *See—*
Carr, Arthur G.; Durgin, Christopher A.; Griffiths, William D.; and Hill, J. Alexander, 5,486,043, Cl. 312-235.100.
Dürkopp Adler Aktiengesellschaft: *See—*
Lubbecke, Udo; Schneuing, Ralf; and Schilling, Gerhard, 5,485,791, Cl. 104-172.400.
Durst, Larry. Sporting event scraper brush. 5,485,647, Cl. 15-111.000.
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Duval, George: *See—*
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Duval, Michel: *See—*
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Dyer, Lester W.: *See—*
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DynaGen, Inc.: *See—*
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Dynka, Danny: *See—*
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Dziuk, Jerome J.: *See—*
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Ealovega, George, to Bushman Limited. Mechanism for controlling the firing rate of an automatic weapon. 5,485,776, Cl. 89-130.000.
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Early, Timothy J., to Ethicon-Endo-Surgery. Quick release package for surgical instrument. 5,485,917, Cl. 206-363.000.

Easley, Paul D., to Dana Corporation. Wheel-speed sensors for motor vehicle mounted in the spreader holes of a differential carrier housing. 5,486,757, Cl. 324-174.000.
Eason, Richard O.: *See—*
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Eastern Company, The: *See—*
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Leidig, Carl F.; Estelle, Lee R.; and Moore, William E., II, 5,486,895, Cl. 355-50.000.
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EasyMove, Inc.: *See—*
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Eaton Corporation: *See—*
Elms, Robert T., 5,487,016, Cl. 364-484.000.
Fishovitz, Anthony J., 5,486,978, Cl. 361-617.000.
Fritsch, Ronald J.; and Holland, Richard J., 5,486,663, Cl. 200-50.00R.
Genise, Thomas A., 5,487,005, Cl. 364-424.100.
Jambor, George F.; and Place, David W., 5,486,661, Cl. 200-47.000.
Lamp, William G.; and Spitzer, Clarence J., 5,486,664, Cl. 200-297.000.
Organek, Gregory J.; Preston, David M.; and Janson, David A., 5,485,904, Cl. 192-35.000.
Oshgan, Thomas J., 5,486,669, Cl. 200-556.000.
Takiishi, Antonio I., 5,486,662, Cl. 200-50.0AA.
Taylor, Glen D., 5,486,972, Cl. 361-154.000.
Ebara Corporation: *See—*
Chino, Hiroyuki; Akasaka, Toshiya; and Iwata, Minoru, 5,486,742, Cl. 318-254.000.
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Edo, Yasuhiro, to NEC Corporation. Semiconductor integrated circuit device equipped with answer system for teaching optional functions to diagnostic system. 5,487,042, Cl. 365-201.000.
Edwards, Stuart D.: *See—*
Lax, Ronald G.; Edwards, Stuart D.; and Sharkey, Hugh R., 5,486,161, Cl. 604-22.000.
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Bajnógel, Judit; Blaskó, Gábor; Budai, Zoltán; Schmidt, Éva; Egyed, András; Fekete, Márton; Gacsályi, István; Gyertyán, István; Mezei, Tibor; Reiter née Esses, Kalára; Simig, Gyula; Szemerédi, Katalin; and Szirt née Kiszelly, Enikő, 5,486,528, Cl. 514-331.000.
Egyed, András: *See—*
Bajnógel, Judit; Blaskó, Gábor; Budai, Zoltán; Schmidt, Éva; Egyed, András; Fekete, Márton; Gacsályi, István; Gyertyán, István; Mezei, Tibor; Reiter née Esses, Kalára; Simig, Gyula; Szemerédi, Katalin; and Szirt née Kiszelly, Enikő, 5,486,528, Cl. 514-331.000.
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Eichenauer, Herbert; Piejko, Karl-Erwin; Bunte, Hans-Jürgen; and Thiem, Hans-Jürgen, to Bayer Aktiengesellschaft. Defoaming compositions for ABS latices. 5,486,583, Cl. 526-68.000.
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Eitrheim, John D., to Cyrix Corporation. Sense amplifier. 5,486,779, Cl. 327-51.000.
Eiwa Co., Ltd.: *See—*
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Eka Nobel Inc.: *See—*
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Ekeland, Robert A.: *See—*
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Electric Power Research Institute: *See—*
Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Stohs, Miriam; Colley, James D.; and Hargrove, Oliver W., Jr., 5,486,342, Cl. 423-243.010.
Electricite de France-Service National: *See—*
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Arsac, Jean-Francois; Bonabal, Catherine; and Laurent, Betty, 5,486,571, Cl. 525-227.000.
Brifaud, Thierry; and Sage, Jean-Marc, 5,486,592, Cl. 528-363.000.
Eli Lilly and Company: *See—*
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Monn, James A., 5,486,620, Cl. 548-515.000.
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Elizabeth Arden Company: *See—*
Guerrero, Angel A., 5,486,352, Cl. 424-59.000.
Elkay Manufacturing Company: *See—*
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Ellaboudy, Ahmed S.: *See—*
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Ellis, Glynn A. Saw blade machining system. 5,485,767, Cl. 76-40.000.
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Elmore, David D.: *See—*
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Elms, Robert T., to Eaton Corporation. Apparatus for genearting a signal representative of total harmonic distortion in waveforms of an A/C electrical system. 5,487,016, Cl. 364-484.000.
Elsasser, Gary: *See—*
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Elscint Ltd.: *See—*
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Eltron International, Inc.: *See—*
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Emerald Hydraulics, Inc.: *See—*
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Emhart Glass Machinery Investments Inc.: *See—*
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Grant, Marty J.; and Pinkerton, Steven J., 5,486,221, Cl. 65-163.000.
Emhart Inc.: *See—*
Hofmann, Jörg; Knetsch, Harald; Liebich, Kurt; Opper, Reinhold; Wiessler, Hans; and Bauer, Alois, 5,486,678, Cl. 219-127.000.
Emi, Shingo; Suzuki, Kyoji; and Ikada, Yoshito, to Teijin Limited. Cellulosic polymer, blood-treating device, and process for producing the same. 5,486,606, Cl. 536-84.000.
Enbee Plastics, Inc.: *See—*
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EnerTech Environmental, Inc.: *See—*
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Engbersen, Johannes F. J.; Kelderman, Erik; Reinhoudt, David N.; and Verboom, Willem, to Akzo Nobel NV. Optically non-linear active waveguiding material comprising donor and acceptor groups-containing triphenylcarbinols. 5,486,559, Cl. 524-299.000.
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England, J. Richard, to R. H. Woods, Ltd. Spherical reaming bit. 5,485,888, Cl. 175-53.000.
Engsbråten, Björn. Explosive composition, manufacture and use thereof. 5,486,247, Cl. 149-46.000.
Enhsen, Alfons; Glombik, Heiner; Kramer, Werner; and Wess, Günther, to Hoechst Aktiengesellschaft. Process for the preparation of 3β-aminocholanic acid derivatives. 5,486,626, Cl. 552-521.000.
Ennis, Michael D.: *See—*
Lin, Chiu-Hong; Haadsma-Svensson, Susanne R.; McCall, Robert B.; Romero, Arthur G.; Darlington, William H.; and Ennis, Michael D., 5,486,611, Cl. 546-62.000.
Enniss, Dan O.; and Simpson, Matthew, to Saint-Gobain/Norton Industrial Ceramics Corporation. Apparatus and method for depositing a substance on a rotating surface. 5,486,380, Cl. 427-248.100.
Enthone-Omi Inc.: *See—*

Hemsley, John D. C.; Gale, Albert W.; and Schwalb, Adrian, 5,486,272, Cl. 204-105.000.
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EP Technologies, Inc.: *See*—
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EPF, Inc.: *See*—
Carroll, Francis C., 5,485,809, Cl. 119-710.000.
Eppeland, John R.; and Mannerud, Jack E., to BGK Finishing Systems, Inc. Method and apparatus for heat treating. 5,485,985, Cl. 266-87.000.
Epstein, Arnold L.: *See*—
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Ergenics, Inc.: *See*—
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Erickson, James A., to Boltswitch, Inc. Operating mechanism for a manually operated load break switch. 5,486,668, Cl. 200-400.000.
Ericsson GE Mobile Communications Inc.: *See*—
Dailey, Timothy E.; Dissorway, Marc A.; and Croucher, Russell L., 5,487,181, Cl. 455-89.000.
Larsson, Jan A., 5,487,179, Cl. 455-69.000.
Eriksson, Karl Ö., to Telefonaktiebolaget LM Ericsson. Method and device for generation of clock signals. 5,486,784, Cl. 327-165.000.
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Erkoboni, David F.: *See*—
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ERNO Raumfahrttechnik GmbH: *See*—
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Ernst, Lauren A.: *See*—
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Erwin Sick GmbH Optik–Elektronik: *See*—
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Estelle, Lee R.: *See*—
Leidig, Carl F.; Estelle, Lee R.; and Moore, William E., II, 5,486,895, Cl. 355-50.000.
Esterowitz, Leon; and Pinto, Joseph F., to United States of America, Navy. Continuously tunable UV Ce:LiSAF solid state laser. 5,487,079, Cl. 372-20.000.
Ethicon Endo-Surgery: *See*—
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Olson, Todd; Meiser, Dan; Steed, Gary; Huffman, Eric; Otten, Matthew; VanOverloop, Ronald; Powell, Darrel; Knodell, Thomas; Rhad, Edward; Chen, Ralph; and Cook, Robert, 5,485,947, Cl. 227-176.100.
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Evans, John P.; and Evans, Robert H. Device for selectively pressurizing or evacuating a chamber with an oscillating air source by metering air through a valve system and a device for drawing into, retaining and evacuating material from a chamber. 5,485,779, Cl. 99-345.000.
Evans, Robert H.: *See*—
Evans, John P.; and Evans, Robert H., 5,485,779, Cl. 99-345.000.
Everhart, Cherie H.: *See*—
Cleveland, Terry R.; Everhart, Cherie H.; Radwanski, Fred R.; and Skoog, Henry, 5,486,381, Cl. 427-294.000.
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Arjunan, Palaniswamy, 5,486,336, Cl. 264-176.100.
Murata, Masahide; and Burkhardt, Terry J., 5,486,585, Cl. 526-130.000.
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Bailey, James R.; and Harrison, Larry E., 5,485,882, Cl. 166-284.000.
Thompson, Arthur H.; and Gist, Grant A., 5,486,764, Cl. 324-323.000.
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Verduijn, Johannes P.; and Gelfings, Pieter E., 5,486,348, Cl. 423-700.000.
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Verduijn, Johannes P., 5,486,498, Cl. 502-66.000.
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Smith, Fred T.; and Smith, Fred P., 5,486,149, Cl. 482-120.000.
Fabinski, Walter; Wiegleb, Gerhard; Hering, Peter; Fuss, Werner; and Haisch, Michael, to Mannesmann Aktiengesellschaft. Non-dispersive infrared spectrometer. 5,486,699, Cl. 250-345.000.
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Hamura, Masayuki; Okuda, Mitsuhiro; and Makihata, Yuuki, 5,486,679, Cl. 219-130.500.
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Farah, John M., Jr.: *See*—
Liang, Chi-Dean; McKearn, John P.; Farah, John M., Jr.; and Mueller, Richard A., 5,486,539, Cl. 514-521.000.
Farinas, Reynaldo G., to Dayton Laboratories, Inc. Topical anti-fungal composition for skin and keratinous tissue. 5,486,537, Cl. 514-462.000.
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Bostman, Jack K.; Farnsworth, John T.; Johnson, Roger D.; and Young, Linda A., 5,486,049, Cl. 366-175.200.
Faryniarz, Joseph R.; and Miner, Philip E., to Chesebrough-Pond's USA Co. Nail polish remover. 5,486,305, Cl. 252-162.000.
Fasano, Michael, to Carlingswitch, Inc. Reset only rocker guard for split case circuit breaker. 5,486,660, Cl. 200-43.160.
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Rodeffer, Charles E.; Denlinger, Edgar J.; and Fathy, Aly E., 5,486,839, Cl. 343-786.000.
Federal-Mogul Corporation: *See*—
Bodem, Jack D., Jr., 5,486,991, Cl. 312-369.000.
Feeney, Brian, to Clorox Company, The. Air inlet valve for water cooler. 5,486,285, Cl. 210-85.000.
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Felton, Clinton D.: *See*—
Groeger, H. Gunter; Serad, George A.; and Felton, Clinton D., 5,486,410, Cl. 428-283.000.
Felton, J. Reed, to T. J. Hale Company. Merchandise display rack. 5,485,928, Cl. 211-52.000.
Fenster, Aaron: *See*—
Holdsworth, David W.; Drangova, Maria; and Fenster, Aaron, 5,485,831, Cl. 128-654.000.
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Fergason, James L.; Berman, Arthur L.; and Jacobs, Stephen D., to Optical Shields, Inc. Liquid crystal light polarizer and method. 5,486,940, Cl. 359-74.000.
Ferraiolo, Frank D.: *See*—
Jordan, Richard C.; Capowski, Robert S.; Casper, Daniel F.; Ferraiolo, Frank D.; Laviola, William C.; and Tomaszewski, Peter R., 5,487,095, Cl. 376-371.000.
Festo KG: *See*—
Stoll, Kurt, 5,485,867, Cl. 137-599.000.
Few, Jimmy D.; and Lewis, James W. L., to University of Tennessee Research Corporation. Laser initiated non-linear fuel droplet ignition. 5,485,720, Cl. 60-39.821.
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FibraSonics, Inc.: *See*—
Brumbach, Joseph F., 5,486,162, Cl. 604-22.000.
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Casimir-Schenkel, Jutta; Fiechter, Armin; Gysin, Beat; and Zimmermann, Wolfgang, 5,486,468, Cl. 435-200.000.
Figueroa, Francisco R.: *See*—
Marin-Carrillo, Edgar M.; Amestica, Luis A.; Figueroa, Francisco R.; and Ramirez-Semeco, Ana M., 5,486,297, Cl. 252-8.600.
Fildan, Gerhard. Garment closure. 5,485,658, Cl. 24-614.000.

Filliman, Paul D.; Ersoz, Nathaniel H.; Saeger, Timothy W.; Duffield, David J.; and Horlander, Karl F., to Thomson Consumer Electronics, Inc. Automatic letterbox detection. 5,486,871, Cl. 348-558.000.

Filotex: *See—*
Hanak, Karl; Prudhon, Daniel; Damilo, Serge; and Rofidal, Patrick, 5,486,654, Cl. 174-113.00R.

Finberg, John: *See—*
Sterling, Jeff; Levy, Ruth; Veinberg, Alex; Goldenberg, Willy; Finberg, John; Youdim, Musa; and Gutman, Arieh, 5,486,541, Cl. 514-657.000.

Fink, Steven J.: *See—*
Nanni, Peter; Fink, Steven J.; and Vanderspool, Jan P., II, 5,487,183, Cl. 455-113.000.

Finney, Damon W.; and Rayfield, Michael J., to International Business Machines Corporation. System for high-speed synchronization across clock domains. 5,487,092, Cl. 375-354.000.

Firari, Harold A.; and Werner, John A. Anti-hijacking and theft prevention device for motor vehicles. 5,486,806, Cl. 340-426.000.

Firey, Joseph C. Multiple sources refuel mechanism. 5,485,812, Cl. 123-23.000.

Firma Krautkrämer GmbH & Co.: *See—*
Karbach, Bernhard; and Patzke, Ottokar, 5,485,751, Cl. 73-618.000.

First Pacific Networks, Inc.: *See—*
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.

Fischer, Craig D., deceased (by Kathy S. Fischer, executrix); Breitbart, Dennis J.; Epstein, Arnold I.; and Zabel, Dale D., to Thomas J. Lipton Co., Division of Conopco, Inc. Meat emulson product. 5,486,374, Cl. 426-574.000.

Fischer, Kathy S., executrix: *See—*
Fischer, Craig D., deceased; Breitbart, Dennis J.; Epstein, Arnold I.; and Zabel, Dale D., 5,486,374, Cl. 426-574.000.

Fishel, James D. Christmas tree ornament protector. 5,486,400, Cl. 428-116.000.

Fisher, Kevin D.: *See—*
Wong-Lam, Ho W.; Bergmans, Johannes W.; and Fisher, Kevin D., 5,487,085, Cl. 375-230.000.

Fishovitz, Anthony J., to Eaton Corporation. Draw-out circuit breaker unit with coordinated cable interlock and shutter. 5,486,978, Cl. 361-617.000.

Flachsel, Martin: *See—*
Altekrüger, Burkhard; Gesche, Roland; Flachsel, Martin; and Aufreiter, Joachim, 5,485,802, Cl. 117-14.000.

Flat Antenna Company Limited: *See—*
Collinge, Gary, 5,486,950, Cl. 359-565.000.

Fletcher, Anthony G., to Celcore, Inc. Off-load cellular system for off-loading cellular service from a main cellular system to increase cellular service capacity. 5,487,101, Cl. 379-60.000.

Fletcher, Horace, III: *See—*
Yardley, John P.; Fletcher, Horace, III; Kelly, Michael G.; and White, Alan C., 5,486,518, Cl. 514-254.000.

Flint, W. Toriran; and Byers, Joseph L., to Reeves Brothers, Inc. Printing blanket having printing face surface profile within specified roughness range. 5,486,402, Cl. 428-141.000.

Flomen, Felix: *See—*
Paiss, Omri; Shallom, Ilan D.; Flomen, Felix; and Haimi-Cohen, Raziel, 5,487,129, Cl. 395-2.420.

Flood, Gary M.; Johnson, David M.; and Marek, Henry S., to General Electric Company. Abrasive tool insert. 5,486,137, Cl. 451-540.000.

Flood, John E.: *See—*
Gingrich, Randall P.; Londa, Michelle; and Flood, John E., 5,486,594, Cl. 528-392.000.

Floss, Peter: *See—*
Kassatly, Amal A.; Chaney, Taylor S.; and Floss, Peter, 5,487,131, Cl. 395-62.000.

Flynn, Gary A.: *See—*
Warshawsky, Alan M.; and Flynn, Gary A., 5,486,513, Cl. 514-214.000.

FMC Corporation: *See—*
King, Victor L.; Wheatley, Thomas A.; and Erkoboni, David F., 5,486,364, Cl. 424-488.000.
Schwindeman, James A.; and Morrison, Robert C., 5,486,343, Cl. 423-413.000.

Fogarty, Charles P. Relevant chess pieces. 5,486,004, Cl. 273-260.000.

Folsom, Lawrence R., to Martin Marietta Corporation. Hydrostatic transmission including a simplified ratio controller. 5,486,142, Cl. 474-69.000.

Foltz, Robert S.; and Gaither, Ronald A., to Xerox Corporation. Capture system employing diverter fluid nozzle. 5,485,935, Cl. 216-65.000.

Fontayne, Diego, to United States Surgical Corporation. Apparatus for applying surgical fasteners. 5,485,952, Cl. 227-178.100.

Food Automation Service Techniques, Inc.: *See—*
Koether, Bernard; Koether, George F., II; and Ubert, Harald, 5,485,780, Cl. 99-419.000.

Ford, Jeffrey E.; Chu, Ellen Y.; and Rude, Harold E., to Minnesota Mining and Manufacturing Company. Coatable urea-aldehyde solutions containing a cocatalyst, coated abrasives made using said solutions, and method of making coated abrasives. 5,486,219, Cl. 51-298.000.

Förderer, Heinz: *See—*
Herklotz, Günter; Förderer, Heinz; and Frey, Thomas, 5,486,721, Cl. 257-666.000.

Foster, Charles H.: *See—*
Bowers, Cyril Y.; Cody, Wayne L.; Hubbs, John C.; Foster, Charles H.; and Momany, Frank A., 5,486,505, Cl. 514-16.000.

Foster, Donald D., to Contico International, Inc. Liquid dispenser assembly with container having a sloped handle. 5,485,942, Cl. 222-324.000.

Foster, Randy C.: *See—*
Sanders, John D.; Holden, Homer N.; and Foster, Randy C., 5,486,023, Cl. 285-258.000.

Foster Wheeler Energy Corporation: *See—*
Van Rhyn, Lucas H., 5,486,670, Cl. 219-60.200.

Fournet-Fayard, Jacques; Galland, Olivier; Garin, Christophe; and Lucet, Alain, to Soprane S.A. Fastener for the osteosynthesis of the spinal column. 5,486,174, Cl. 606-61.000.

Fowble, Juliana V., to Delco Electronics Corporation. Connectors for optical fibers including resilient/expandable members. 5,487,123, Cl. 385-70.000.

Fox, Carol A.: *See—*
Bayley, Robert D.; Fox, Carol A.; Hoffend, Thomas R.; Paxson, James R.; and Grushkin, Bernard, 5,486,444, Cl. 430-109.000.

Fox, Duane M.; and Schoen, Joel A., to Intermec Incorporated. Method and apparatus for sensing the length of label or tag media by detecting changes in relative thickness. 5,486,063, Cl. 400-708.000.

Foxwell, W. John. Engine torque sensing arrangement. 5,485,757, Cl. 73-862.321.

Frank, Alfred: *See—*
Guyomard, Daniel; Anderson, James L., Jr.; Frank, Alfred; and Chavaillaz, Georges, 5,485,941, Cl. 222-1.000.

Frankel, Matthew J.: *See—*
Norfleet, James; Carter, Willie J.; Frankel, Matthew J.; and Gaffar, Abdul, 5,486,350, Cl. 424-49.000.

Frauenfelder, Martin: *See—*
Bergmann, Klaus; Schwab, Jacques; and Frauenfelder, Martin, 5,486,151, Cl. 483-1.000.

Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V.: *See—*
Gehner, Andreas; Hess, Günther; Kück, Heinz; and Vogt, Holger, 5,486,851, Cl. 347-258.000.
Maischner, Dora; Drenker, Alexander J.; Abels, Peter; and Beyer, Eckhard, 5,486,677, Cl. 219-121.830.

Fredberg, Jeffrey J.: *See—*
Butler, James P.; Fredberg, Jeffrey J.; Ingber, Donald E.; and Wang, Ning, 5,486,457, Cl. 435-7.200.

Freedman, Robert; and Morriss, Christopher E., to Schlumberger Technology Corp. Apparatus including multi-wait time pulsed NMR logging method for determining accurate T2-distributions and accurate T1/T2 ratios and generating a more accurate output record using the updated T2-distributions and T1/T2 ratios. 5,486,762, Cl. 324-303.000.

Freeman, Paul R. W., to Hewlett-Packard Company. Rule acquisition in knowledge based systems. 5,487,135, Cl. 395-75.000.

Freilinger, Patrick L.: *See—*
Wong, Tak M.; Etsheidt, Ronald J.; and Freilinger, Patrick L., 5,486,666, Cl. 200-304.000.

Freitas, Michael W.; and Miller, Wayne D., to Dexide, Inc. Surgical apparatus. 5,486,185, Cl. 606-142.000.

Fremgen, Dieter: *See—*
McMills, Corey; Mattis, John; and Fremgen, Dieter, 5,486,120, Cl. 439-521.000.

Frenken, Egbert; and Schöning, Michael, to M & V Reklametechnik Schoning-Krieg. Hinged support panel display prism. 5,485,693, Cl. 40-505.000.

Frey, Thomas: *See—*
Herklotz, Günter; Förderer, Heinz; and Frey, Thomas, 5,486,721, Cl. 257-666.000.

Friberg, Nathan J.: *See—*
Walto, Joseph J.; Friberg, Nathan J.; and Niskanen, Floyd D., 5,485,963, Cl. 239-663.000.

Friese, Karl-Hermann; Weyl, Helmut; and Wiedenmann, Hans-Martin, to Robert Bosch GmbH. Electrochemical measuring probe. 5,486,279, Cl. 204-429.000.

Fritsch, Ronald J.; and Holland, Richard J., to Eaton Corporation. Motor control center removable control unit interlock. 5,486,663, Cl. 200-50.00R.

Fritz, Jack D., Jr. Boat utility light. 5,486,987, Cl. 362-226.000.

Fritz, Lawrence E. Stackable space saving container. 5,485,920, Cl. 206-509.000.

Fritze, Keith R.: *See—*
Killpatrick, Joseph E.; Berndt, Dale F.; Fritze, Keith R.; and Cary, Gregory E., 5,486,920, Cl. 356-350.000.

Frostell, Claes: *See—*
Zapol, Warren M.; and Frostell, Claes, 5,485,827, Cl. 128-200.140.

Fuchs, Ingbert E., to Board of Regents, The University of Texas System. Production of multilayer productive coverings on conventional dip molding lines. 5,486,322, Cl. 264-46.500.

Fuisz Technologies Ltd.: *See—*
Whistler, Roy L., 5,486,507, Cl. 514-54.000.

Fuji Chemical Industry Co., Ltd.: *See—*
Takado, Kanemasa; and Murakami, Tatsuo, 5,486,365, Cl. 424-602.000.

Fuji Electric Co., Ltd.: *See—*
Saito, Shigemasa, 5,486,960, Cl. 360-99.080.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Sakakiyama, Ryuzo; Shirakawa, Kiminaga; and Tezuka, Kazunari, 5,486,147, Cl. 477-125.000.

Fuji Oozx Inc.: *See—*
Shida, Toshimitsu, 5,485,815, Cl. 123-188.300.

Fuji Photo Film Co., Ltd.: *See*—
Katsuma, Nobuo; Ueda, Satoshi; and Matsukawa, Hiroyuki, 5,486,856, Cl. 347-175.000.
Matsuhita, Tetunori; Kamikawa, Hiroshi; Saoto, Hiroshi; Nomura, Kimitsu; and Tsurumi, Mitsuyuki, 5,486,446, Cl. 430-156.000.
Mogi, Fumio, 5,486,890, Cl. 354-299.000.
Yim, Seung-jae, 5,486,356, Cl. 424-76.100.
Fuji Photo Optical Co., Ltd.: *See*—
Omiya, Akio, 5,486,887, Cl. 354-149.110.
Shiina, Michihiro; Iwamoto, Jun'ichi; and Iwai, Fumio, 5,486,888, Cl. 354-187.000.
Fuji Xerox Co., Ltd.: *See*—
Kimura, Shunichi; Koshi, Yutaka; and Kamizawa, Koh, 5,487,119, Cl. 382-239.000.
Ota, Takeshi, 5,487,122, Cl. 385-46.000.
Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Camera with exposure control interlocked with lens movement. 5,486,894, Cl. 354-446.000.
Fujii, Yozo; Moriguchi, Hiroyuki; Ikusami, Yoshikazu; Matsunawa, Masahiko; Tamura, Akihiko; Yasuda, Kazuo; Miwa, Tadashi; Horiuchi, Tatsumi; Kishimoto, Tadao; Fujimaki, Yoshihide; Takagiwa, Hiroyuki; and Tamura, Takashi, to Konica Corporation. Color image forming apparatus with photoreceptor protector. 5,486,898, Cl. 355-200.000.
Fujikake, Hideo; Takizawa, Kuniharu; Hirose, Juichi; and Kobayashi, Tatsushi, to Tomoegawa Paper Co., Ltd.; and Nippon Hoso Kyokai. Optically addressed spatial light modulator. 5,486,936, Cl. 359-51.000.
Fujimaki, Yoshihide: *See*—
Fujii, Yozo; Moriguchi, Hiroyuki; Ikunami, Yoshikazu; Matsunawa, Masahiko; Tamura, Akihiko; Yasuda, Kazuo; Miwa, Tadashi; Horiuchi, Tatsumi; Kishimoto, Tadao; Fujimaki, Yoshihide; Takagiwa, Hiroyuki; and Tamura, Takashi, 5,486,898, Cl. 355-200.000.
Fujimoto, Katsuhiko: *See*—
Aida, Satoshi; Shibata, Mariko; Fujimoto, Katsuhiko; Ishibashi, Yoshiharu; Suzuki, Takuji; Sato, Kozo; and Itoh, Ayao, 5,485,839, Cl. 128-653.100.
Fujimura, Shigeru: *See*—
Takahashi, Kimikazu; Mitake, Haruko; and Fujimura, Shigeru, 5,487,144, Cl. 395-161.000.
Fujioka, Kaoru, to Bridgestone Metalpha Co., Ltd. Take-up reel for metallic filament. 5,485,968, Cl. 242-125.200.
Fujisaki, Takahiko: *See*—
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Harada, Naoki; Kayane, Yutaka; and Omura, Takashi, 5,486,607, Cl. 544-76.000.
Fujita, Hiroyuki; Yoshida, Iwao; Takagi, Mitsuo; Manabe, Sadao; and Fukai, Konosuke, to Research Foundation for Microbial Diseases of Osaka University, The. A DNA coding for a Flavivirus antigen. 5,486,473, Cl. 435-240.200.
Fujita, Kenji, to Mazda Motor Corporation. Drive control system for automobile. 5,485,892, Cl. 180-167.000.
Fujita, Shigehisa; and Sato, Kenji, to Honda Giken Kogyo Kabushiki Kaisha. Computer-aided design system. 5,487,021, Cl. 364-578.000.
Fujita, Takashi; and Sugano, Toshihiko, to Mitsubishi Chemical Corporation. Process for preparing propylene block copolymers. 5,486,572, Cl. 525-247.000.
Fujita, Yasushi: *See*—
Soda, Chiharu; Fujita, Yasushi; Fukuda, Yoshihiko; and Ichihashi, Kaoru, 5,486,125, Cl. 440-75.000.
Fujitec Co., Ltd.: *See*—
Matsumoto, Kimio; Sawaike, Ichihiro; Nishigakik, Atsuo; Yamashita, Akitoshi; and Tsumura, Tomohiko, 5,485,897, Cl. 187-399.000.
Fujitru Limited: *See*—
Akaogi, Takao; Yoshida, Masanobu; Ogawa, Yasushige; Kasa, Yasushi; and Kawamura, Shouichi, 5,487,036, Cl. 365-189.090.
Akima, Hideo; Ishikura, Yoshikiyo; and Kishi, Takaaki, 5,485,901, Cl. 188-164.000.
Furukawa, Yukio, 5,487,070, Cl. 370-108.000.
Iwasa, Seiichi; Motoyama, Hideyuki; and Yoshioka, Makoto, 5,486,059, Cl. 400-488.000.
Kakuguchi, Kazuhiro, 5,486,061, Cl. 400-605.000.
Kakuma, Satoshi; Uriu, Shiro; Yoshimura, Shuji; Aso, Yasuhiro; and Murayama, Masami, 5,487,063, Cl. 370-56.000.
Kitamoto, Yoshito; Takagi, Masahiro; Akiba, Hiroshi; and Seki, Kazuyuki, 5,486,276, Cl. 204-192.200.
Nakayama, Noriko; and Nakayama, Hiroshi, 5,487,142, Cl. 395-143.000.
Ohtake, Koji, 5,487,180, Cl. 455-54.100.
Tsurumaru, Shinichiro, 5,486,062, Cl. 400-618.000.
Fujitsu Personal Systems, Inc.: *See*—
Ichikawa, Shinpei; Hamerton-Kelly, Paul R.; and Anglin, Noah L., 5,486,942, Cl. 359-83.000.
Fujiwara, Shigeru: *See*—
Watanabe, Takeshi; Yoshida, Minoru; Fujiwara, Shigeru; and Takahashi, Masashi, 5,486,907, Cl. 355-219.000.
Fukahori, Hidehiko: *See*—
Suzuki, Kenji; Ishizaki, Akira; Ohtaka, Keiji; Suda, Yasuo; Fukahori, Hidehiko; Nagano, Akihiko; Konishi, Kazuki; and Tsunekawa, Tokuichi, 5,486,892, Cl. 354-402.000.
Fukai, Konosuke: *See*—
Fujita, Hiroyuki; Yoshida, Iwao; Takagi, Mitsuo; Manabe, Sadao; and Fukai, Konosuke, 5,486,473, Cl. 435-240.200.
Fukaya, Haruhiko; Abe, Takashi; Hayashi, Eiji; Hayakawa, Yoshio; and Baba, Hajime, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Nitrogen-containing perfluoroalkyl bromide and method for production thereof. 5,486,275, Cl. 204-157.600.
Fukuchi, Masakazu; Morita, Shizuo; Kayano, Shizuo; and Yoshino, Kunihisa, to Konica Corporation. Color image recording apparatus with a detector to detect a superimposed toner image density and correcting its color balance. 5,486,901, Cl. 355-208.000.
Fukuda, Yoshihiko: *See*—
Soda, Chiharu; Fujita, Yasushi; Fukuda, Yoshihiko; and Ichihashi, Kaoru, 5,486,125, Cl. 440-75.000.
Fukumura, Kagenori: *See*—
Asahara, Norimi; Fukumura, Kagenori; Hojo, Yasuo; and Ozaki, Kazuhisa, 5,486,146, Cl. 477-65.000.
Fukumura, Keiji: *See*—
Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; Kojima, Shin-ichi; Minney, Jack L.; Oishi, Motohiro; Fukumura, Keiji; and Nakanishi, H., 5,487,038, Cl. 365-191.000.
Fukushima, Michiyuki: *See*—
Nakajima, Shin; Fukushima, Michiyuki; and Hirao, Noriyoshi, 5,486,404, Cl. 428-172.000.
Fukushima, Yasuo: *See*—
Matsushita, Osami; Yoseyama, Mitsuho; Takahashi, Naohiko; Fukushima, Yasuo; Hiroshima, Minoru; Kaneki, Tadashi; Abe, Yoshiaki; and Sakanashi, Naofumi, 5,486,729, Cl. 310-90.500.
Fukuzawa, Yoshinao: *See*—
Masaki, Koichi; Fukuzawa, Yoshinao; Kitazawa, Kanji; Azuma, Takanobu; Naganuma, Naohiro; and Hosoda, Tetsuo, 5,486,731, Cl. 310-180.000.
Fulks, Ronald T., to Xerox Corporation. Thin-film structure with insulating and smoothing layers between crossing conductive lines. 5,486,939, Cl. 359-74.000.
Fuller, Timothy J.: *See*—
Van Dusen, John G.; Fuller, Timothy J.; and Hudson, Deborah M., 5,486,445, Cl. 430-110.000.
Funabashi, Motohisa: *See*—
Ichimori, Toshihide; Maeda, Akira; Funabashi, Motohisa; and Nakano, Toshihiko, 5,487,130, Cl. 395-3.000.
Funakoshi, Wataru: *See*—
Hirata, Masumi; Funakoshi, Wataru; and Sasaki, Katsushi, 5,486,555, Cl. 524-83.000.
Fung, Daniel Y. C., to Kansas State University Research Foundation. Enzymatic method for accelerating fermentation of comestible products. 5,486,367, Cl. 426-7.000.
Furay, David M.: *See*—
Morehouse, James H.; Furay, David M.; Volk, Steven B.; Utenick, Michael R.; Dunckley, James A.; Blagaila, John H.; Hopper, James F.; and Klein, Thomas A., 5,486,964, Cl. 360-105.000.
Furukawa Electric Co., Ltd., The: *See*—
Hashiguchi, Koichi; Matsumoto, Yoshihiro; Imanaka, Makoto; Hira, Takaaki; Ikeda, Rinsei; Nishiyama, Naoki; Totsuka, Nobuo; Bekki, Yoichiro; and Nabae, Motohiro, 5,486,243, Cl. 148-552.000.
Furukawa, Yukio, to Fujitsu Limited. Apparatus for reproducing received data. 5,487,070, Cl. 370-108.000.
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Fusho, Yuichi; and Yajima, Yoshihiro, to Showa Denko Kabushiki Kaisha. Catalase from *Bacillus Subtilis* IAM 1026 (Ferm BP-4844). 5,486,467, Cl. 435-192.000.
Fuss, Werner: *See*—
Fabinski, Walter; Wiegleb, Gerhard; Hering, Peter; Fuss, Werner; and Haisch, Michael, 5,486,699, Cl. 250-345.000.
Fuwa, Yoshio; Saitou, Kouji; and Yamashita, Jiro, to Dow Corning Asia, Ltd; and Toyota Motor Company. Wear-resistant lubricant composition. 5,486,299, Cl. 252-12.000.
G. D. Searle & Co.: *See*—
Lee, Len F.; Penning, Thomas D.; and Kramer, Steven W., 5,486,534, Cl. 514-406.000.
Liang, Chi-Dean; McKearn, John P.; Farah, John M., Jr.; and Mueller, Richard A., 5,486,539, Cl. 514-521.000.
G.D Societa' Per Azioni: *See*—
Draghetti, Fiorenzo, 5,486,081, Cl. 414-225.000.
Gabhart, Thomas S., to Product Strategies, Inc. Hospital bed guard. 5,485,699, Cl. 49-394.000.
Gacsályi, István: *See*—
Bajnógel, Judit; Blaskó, Gábor; Budai, Zoltán; Schmidt, Éva; Egyed, András; Fekete, Márton; Gacsályi, István; Gyertyán, István; Mezei, Tibor; Reiter née Esses, Kalára; Simig, Gyula; Szemerédi, Katalin; and Szirt née Kiszelly, Enikő, 5,486,528, Cl. 514-331.000.
Gaetani, Joseph D.: *See*—
Loew, Ellen G.; and Gaetani, Joseph D., 5,486,003, Cl. 273-187.00R.
Gaffar, Abdul: *See*—
Norfleet, James; Carter, Willie J.; Frankel, Matthew J.; and Gaffar, Abdul, 5,486,350, Cl. 424-49.000.
Gaggar, Satish: *See*—
Noell, John L. W.; Gaggar, Satish; McCarty, George P.; and Miller, Kenneth, 5,486,407, Cl. 428-215.000.
Gagne, Daniel C.; and Pronk, Arie A. Bladed vehicle with load gripping arms. 5,486,085, Cl. 414-724.000.
Gaither, Ronald A.: *See*—

Foltz, Robert S.; and Gaither, Ronald A., 5,485,935, Cl. 216-65.000.
Galambos, Adam F.: *See*—
Clementini, Luciano; Galambos, Adam F.; Lesca, Giuseppe; Spagnoli, Leonardo; Starsinic, Michael E.; and Ogale, Kumar, 5,486,419, Cl. 428-397.000.
Galand, Claude; and Lebizay, Gerald, to International Business Machines Corporation. Network layer packet structure. 5,487,064, Cl. 370-60.000.
Gale, Albert W.: *See*—
Hemsley, John D. C.; Gale, Albert W.; and Schwalb, Adrian, 5,486,272, Cl. 204-105.00R.
Gallagher, John E.; and Gallagher, Terence J., to Total Register, Inc. Dual drive registration system. 5,486,254, Cl. 156-229.000.
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Gallagher, John E.; and Gallagher, Terence J., 5,486,254, Cl. 156-229.000.
Galland, Olivier: *See*—
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Gallina, Luca: *See*—
Gorza, Roberto; Gallina, Luca; and Tessari, Pino, 5,485,688, Cl. 36-117.000.
Gamemax Corporation: *See*—
Chang, Yuan F., 5,485,907, Cl. 194-203.000.
Gannholm, Martin R.: *See*—
Capps, Stephen P.; and Gannholm, Martin R., 5,487,054, Cl. 368-185.000.
Gao, Fuquan: *See*—
Achter, Eugene K.; Klotzsch, Helmut W.; Thompson, Craig D.; Gao, Fuquan; and Bosworth, Jonathan E., 5,486,693, Cl. 250-223.00B.
Gardner, Frederick J.; Day, Michael J.; Brandon, Nigel P.; and Brownell, John B., to Rolls-Royce plc. Solid oxide fuel cell stack. 5,486,428, Cl. 429-19.000.
Gareis, Galen M., to Belden Wire & Cable Company. Shielded cable. 5,486,649, Cl. 174-36.000.
Garger, Stephen J., Jr.: *See*—
della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., 5,486,351, Cl. 424-59.000.
Garin, Christophe: *See*—
Fournet-Fayard, Jacques; Galland, Olivier; Garin, Christophe; and Lucet, Alain, 5,486,174, Cl. 606-61.000.
Garland, Robert B.: *See*—
Summers, James B., Jr.; Davidsen, Steven K.; Curtin, Michael L.; Heyman, H. Robin; Sheppard, George S.; Xu, Lianhong; Carrera, George M., Jr.; and Garland, Robert B., 5,486,525, Cl. 514-303.000.
Garmy, Michel; and Ravel, Bernard, to Compagnie Generale Des Etablissements Michelin - Michelin et Cie. Device for assembly of a tire casing and an annular tread member extended by centrifugation. 5,486,260, Cl. 156-406.200.
Gas Research Institute: *See*—
Bassett, William W.; Russ, Robert M.; and Webster, Thomas L., 5,485,953, Cl. 236-49.300.
Gates, Cynthia A.: *See*—
Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Curran, Timothy T.; and Johnston, J. O'Neal, 5,486,511, Cl. 514-178.000.
Gatlin, Larry W. Hydrogen sulfide converter. 5,486,605, Cl. 536-55.200.
Gatz, Stephen E.: *See*—
Stanford, Ralph F.; and Gatz, Stephen E., 5,486,288, Cl. 210-235.000.
Gavin, David F.: *See*—
Schmidt, Eckart W.; and Gavin, David F., 5,485,722, Cl. 60-219.000.
GBP Corporation: *See*—
Godfrey, Bruce T., 5,485,727, Cl. 60-572.000.
GDB Enterprises, Inc.: *See*—
Denove, Thomas F.; and Blowers, William L., 5,486,914, Cl. 356-221.000.
Gebr. Happich GmbH: *See*—
Lecorvaisier, René; and Buchheit, Christian, 5,486,033, Cl. 296-97.130.
Gehner, Andreas; Hess, Günther; Kück, Heinz- and Vogt, Holger, to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V. Illumination device using a pulsed laser source a Schlierea optical system and a matrix addressable surface light modulator for producing images with undifracted light. 5,486,851, Cl. 347-258.000.
Geick, Bernd: *See*—
Schmidt, Günther; Randel, Peter; Engels, Hans-Werner; and Geick, Bernd, 5,485,986, Cl. 266-280.000.
Geiner, Robert V.; and Jensen, David L., to International Business Machines Corporation. Method and system for global optimization of device allocation. 5,487,168, Cl. 395-650.000.
Gellings, Pieter E.: *See*—
Verduijn, Johannes P.; and Gellings, Pieter E., 5,486,348, Cl. 423-700.000.
Gemplus Card International: *See*—
Le Roux, Jean-Yves, 5,486,687, Cl. 235-382.000.
General Atomics: *See*—
Ohkawa, Tihiro, 5,486,337, Cl. 422-100.000.
General DataComm, Inc.: *See*—
Cole, Paul D., 5,486,825, Cl. 341-50.000.
General Electric Company: *See*—
Aleshin, Stephen, 5,486,676, Cl. 219-121.630.
Bella, Donald L.; Glynn, Christopher C.; and Humke, Brian J., 5,486,086, Cl. 415-9.000.
Borman, Willem F. H.; and Liu, Nan-I, 5,486,562, Cl. 524-451.000.
Castonguay, Roger N.; Rosen, James L.; and Zaffetti, Mark A., 5,486,667, Cl. 200-400.000.
Flood, Gary M.; Johnson, David M.; and Marek, Henry S., 5,486,137, Cl. 451-540.000.
Herd, Kenneth G., 5,485,730, Cl. 62-51.100.
Horan, Patrick J.; Balch, Richard A.; Elmore, David D.; and Legere, Joseph R., 5,486,755, Cl. 324-110.000.
Jernstrom, Nana B.; and Wilson, Jeffrey N., 5,486,046, Cl. 312-408.000.
Konrad, Charles E.; and Boothe, Richard W., 5,486,748, Cl. 318-811.000.
Noell, John L. W.; Gaggar, Satish; McCarty, George P.; and Miller, Kenneth, 5,486,407, Cl. 428-215.000.
Reismiller, Paul R.; and Brunemann, George A., Jr., 5,486,997, Cl. 364-165.000.
Rhoda, James E.; Bradley, Thomas A.; and Mielke, Mark J., 5,486,095, Cl. 416-214.00A.
Schwabe, Robert J.; Eggleston, Michael R.; and Coffin, Louis F., Jr., 5,486,767, Cl. 324-715.000.
Wood, Jonathan M.; Hauer, Thomas A.; and Lippmeier, William C., 5,485,959, Cl. 239-265.410.
General Hospital Corporation, The: *See*—
Zapol, Warren M.; and Frostell, Claes, 5,485,827, Cl. 128-200.140.
General Motors Corporation: *See*—
Wong, Daniel K. C., 5,486,252, Cl. 156-212.000.
Genise, Thomas A., to Eaton Corporation. Method/system for determination of gross combined weight of vehicles equipped with electronic data links. 5,487,005, Cl. 364-424.100.
Genova, John R., to Springs Window Fashions Division, Inc. Window shade with break-away attachment of lift cords to bottom rail. 5,485,875, Cl. 160-168.100.
GenRad, Inc.: *See*—
Khazam, Moses; and Mastrocola, Aldo, 5,486,753, Cl. 324-72.500.
Gentle, Theresa E.; and Lutz, Michael A., to Dow Corning Corporation. Organosilicon compounds and low temperature curing organosiloxane compositions containing same. 5,486,565, Cl. 524-730.000.
Genus, Inc.: *See*—
O'Connor, John P.; and Smith, John W., 5,486,702, Cl. 250-492.210.
Geophysical Exploration & Development Corporation: *See*—
Cordsen, Andreas, 5,487,052, Cl. 367-56.000.
George, John B., to Thomson Consumer Electronics, Inc. Waveform correction circuit for dynamic focus amplifier. 5,486,741, Cl. 315-382.000.
Gerber Garment Technology, Inc.: *See*—
Chaiken, Craig L., 5,487,011, Cl. 364-470.000.
Gerber, Heinz J., 5,486,389, Cl. 428-40.000.
Gerber, Heinz J., to Gerber Garment Technology, Inc. Roll of tape with doubly adhesively faced pads. 5,486,389, Cl. 428-40.000.
Gerstenberg & Agger A/S: *See*—
Zeuthen, Klas, 5,485,880, Cl. 165-94.000.
Gesche, Roland: *See*—
Altekrüger, Burkhard; Gesche, Roland; Flachsel, Martin; and Aufreiter, Joachim, 5,485,802, Cl. 117-14.000.
Gething, Maryjane H.: *See*—
Sambrook, Joseph F.; Madison, Edwin L.; Goldsmith, Elizabeth J.; and Gething, Maryjane H., 5,486,602, Cl. 536-23.200.
Ghandour, Osman A., to Trustees of Columbia University, The. Laser etching of semiconductors. 5,486,264, Cl. 156-635.100.
Ghate, Ranjit: *See*—
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.
Ghezzi, Paolo; and Maurelli, Alfonso, to SGS-Thomson Microelectronics, S.r.l. Process for the manufacture of an integrated voltage limiter and stabilizer in flash EEPROM memory devices. 5,486,486, Cl. 437-43.000.
Giantonio, Anacleto; and Panzone, Gianbattista, to Gruppo Lepetit S.p.A. Teicoplanin recovery process. 5,486,465, Cl. 435-70.100.
Gibbons, James F.: *See*—
Gronet, Christian M.; and Gibbons, James F., 5,487,127, Cl. 392-416.000.
Gibbs, Ronnie D. Apparatus and methods for shielding the keel and/or bow of a watercraft. 5,485,801, Cl. 114-219.000.
Gibson, Gary A.: *See*—
Popescu, Valeri; Schultz, Merle A.; Gibson, Gary A.; Spracklen, John E.; and Lightner, Bruce D., 5,487,156, Cl. 395-375.000.
Gibson, Tommy W.: *See*—
Atkins, Richard S.; Gibson, Tommy W.; and Ransome, Philip P., 5,487,108, Cl. 379-355.000.
Giddings, Brandford E.: *See*—
Curatolo, Benedict S.; Li, George S.; and Giddings, Brandford E., 5,486,409, Cl. 428-221.000.
Gierulski, Alfred: *See*—
Horn, Dieter; Lueddecke, Erik; Gierulski, Alfred; Kroehl, Thomas; and Lorencak, Primoz, 5,486,904, Cl. 356-73.000.
Gilat, Alexander R.: *See*—
Hirshowitz, Bernard; Levy, Amnon; Gilat, Alexander R.; Rogel, Eitan; Stein, Jeffrey; and Borgia, Julian, 5,486,196, Cl. 606-218.000.
Gilbert, Douglas J.: *See*—
Randall, Martin; Campbell, Paul; and Gilbert, Douglas J., 5,486,844, Cl. 345-113.000.

Gilbert, Klay: *See*—
Creed, Kevin; and Gilbert, Klay, 5,485,976, Cl. 244-118.600.
Gilead Sciences, Inc.: *See*—
Buhr, Chris A., 5,486,603, Cl. 536-24.300.
Gilissen, Hermann P. J.: *See*—
Soes, Lucas; and Gilissen, Hermann P. J., 5,486,114, Cl. 439-62.000.
Gillette Company, The: *See*—
Callaghan, David T.; Phipps, Alan M.; and Provancal, Stephen J., 5,486,347, Cl. 423-623.000.
Gillette, Stephen J.: *See*—
McCay, Steve W.; Harshman, Keith A.; Gillette, Stephen J.; and Wentzel, Dale A., 5,485,989, Cl. 271-2.000.
Ginami, Giancarlo; Laurin, Enrico; Lucherini, Silvia; and Vajana, Bruno, to SGS-Thomson Microelectronics S.r.l. Method for adjusting the threshold of a read-only memory to achieve low capacitance and high breakdown voltage. 5,486,487, Cl. 437-45.000.
Gingras, Earl, to Gingras Separators Inc. Externally adjustable liquid interface for a centrifugal separator. 5,486,153, Cl. 494-57.000.
Gingras Separators Inc.: *See*—
Gingras, Earl, 5,486,153, Cl. 494-57.000.
Gingrich, Randall P.; Londa, Michelle; and Flood, John E., to Shell Oil Company. Polyketone polymers as nylon toughners. 5,486,594, Cl. 528-392.000.
Ginsburg, Robert. Method and apparatus for controlling a patient's body temperature by in situ blood temperature modification. 5,486,208, Cl. 607-106.000.
Giraldi, Roberto: *See*—
Balducci, Sergio; and Giraldi, Roberto, 5,485,648, Cl. 15-175.000.
Girardeau, James W., Jr., to Motorola, Inc. Method and apparatus for calculating a divider in a digital phase lock loop. 5,486,792, Cl. 331-10.000.
Girardeau, James W., Jr., to Motorola, Inc. Data processing system for hardware implementation of square operations and method therefor. 5,487,024, Cl. 364-753.000.
Girot, Pierre: *See*—
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Gist, Grant A.: *See*—
Thompson, Arthur H.; and Gist, Grant A., 5,486,764, Cl. 324-323.000.
Glacken, Michael W.: *See*—
Zygourakis, Kyriacos; Bednarczyk, John L.; McIntyre, Bradley W.; and Glacken, Michael W., 5,487,112, Cl. 382-6.000.
Glase, Shelly A.: *See*—
Downing, Dennis M.; Glase, Shelly A.; Johnson, Stephen J.; Wise, Lawrence D.; and Wright, Jonathan L., 5,486,517, Cl. 514-253.000.
Glaser, Helmut F., to Varta Batterie Aktiengesellschaft. Button cell. 5,486,433, Cl. 429-164.000.
Glaxo SpA: *See*—
Trist, David; Pentassuglia, Giorgio; Tranquillini, Maria E.; and Ursini, Antonella, 5,486,514, Cl. 514-221.000.
Glenn, Max C.: *See*—
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Gliatech, Inc.: *See*—
Durant, Graham J.; Khan, Amin M.; and Tedford, Clark E., 5,486,526, Cl. 514-319.000.
Glidden, John L., Sr. Wool purification. 5,486,211, Cl. 8-142.000.
Glock, Gaston. Laser aiming device. 5,485,695, Cl. 42-103.000.
Glombik, Heiner: *See*—
Enhsen, Alfons; Glombik, Heiner; Kramer, Werner; and Wess, Günther, 5,486,626, Cl. 552-521.000.
Glynn, Christopher C.: *See*—
Bella, Donald L.; Glynn, Christopher C.; and Humke, Brian J., 5,486,086, Cl. 415-9.000.
Gnade, Bruce E.; Pinizzotto, Russell F.; and Littler, Christopher L., to Texas Instruments Incorporated. Three-dimensional ferroelectric integrated circuit having insulation layer between memory layers. 5,487,031, Cl. 365-145.000.
Go, Shintetsu: *See*—
Kashizaki, Yoshio; Miyazaki, Hajime; Suzuki, Koichi; Go, Shintetsu; and Sato, Kazuma, 5,486,440, Cl. 430-62.000.
Goad, Sharon E. Door-mounted poster support. 5,485,694, Cl. 40-661.000.
Goddard, Franklin S. Pneumatic suspension system dampener. 5,486,017, Cl. 280-711.000.
Godfrey, Bruce T., to GBP Corporation. Fastener installation tool. 5,485,727, Cl. 60-572.000.
Godin, Gary; and Lambert, Philip, to Godin, Gary. Wheel assembly for a wheelchair, incorporating a change speed hub. 5,486,016, Cl. 280-250.100.
Goetz, Raymond: *See*—
Hesse, Philip W.; Goetz, Raymond; and Lenko, Daniel, 5,485,786, Cl. 102-202.500.
Goff, Gerald L.; Smith, Michael D.; and Conboy, Michael R., to Advanced Micro Devices, Inc. Boat test apparatus. 5,485,759, Cl. 73-865.900.
Goiffon, John J.: *See*—
Rademaker, Robert A.; Goiffon, John J.; Connell, Michael L.; and Olszewski, Walter K., 5,485,745, Cl. 73-151.000.
Golben, P. Mark: *See*—
Hanley, David J.; Huston, E. Lee; and Golben, P. Mark, 5,485,884, Cl. 169-19.000.
Gold, Philip: *See*—
Mumme, Charles W.; and Gold, Philip, 5,486,177, Cl. 606-79.000.
Goldcrown Machinery, Inc.: *See*—
Kilmer, Mark C., Sr., 5,486,130, Cl. 451-11.000.
Goldenberg, Willy: *See*—
Sterling, Jeff; Levy, Ruth; Veinberg, Alex; Goldenberg, Willy; Finberg, John; Youdim, Musa; and Gutman, Arieh, 5,486,541, Cl. 514-657.000.
Goldsmith, Elizabeth J.: *See*—
Sambrook, Joseph F.; Madison, Edwin L.; Goldsmith, Elizabeth J.; and Gething, Maryjane H., 5,486,602, Cl. 536-23.200.
Goldstar Co., Ltd.: *See*—
Choi, Jeong D.; Cheon, In K.; Song, Geun H.; and Park, Hee Y., 5,486,958, Cl. 360-85.000.
Kim, Dong-Hyeon, 5,485,777, Cl. 92-84.000.
Goldstar Electron Co., Ltd.: *See*—
Kim, Ho H., 5,486,842, Cl. 345-26.000.
Goldstein, Léon; and Bonnevie, Dominique, to Alcatel N.V. Method of manufacturing a semiconductor component, in particular a buried ridge laser. 5,486,489, Cl. 437-129.000.
Gonczy, Stephen T.: *See*—
Leung, Roger Y.-K.; and Gonczy, Stephen T., 5,486,250, Cl. 156-89.000.
Good Humor Corporation: *See*—
Holt, Christopher B.; and Telford, Julia H., 5,486,373, Cl. 426-565.000.
Goodine, Dennis: *See*—
Bourne, George; Davis, Randall W.; Duval, George; Goodine, Dennis; Lock, James E.; Ouellette, Gerry; Perry, Stanton B.; Wagner, Maria; and Whittaker, Gregory R., 5,486,193, Cl. 606-194.000.
Goodwin, Brent E.; Keller, Thomas P.; Makley, James A.; and Moore, Mark W., to Monarch Marking Systems, Inc. Labeler with adjustable roll mounting means. 5,486,259, Cl. 156-384.000.
Gorbell, Brian N.; Wozniczka, Beguslav M.; and Chow, Clarence Y., to Ballard Power Systems Inc. Internal fluid manifold assembly for an electrochemical fuel cell stack array. 5,486,430, Cl. 429-35.000.
Gordon, James N.; and Teng, Ganghui, to Polaroid Corporation. Protected reflection image. 5,486,397, Cl. 428-76.000.
Gordon, Julian; Hawkes, Richard; Niday, Evelyn; and Towbin, Harry, to Ciba-Geigy Corporation. Devices and kits for immunological analysis. 5,486,452, Cl. 435-5.000.
Gorza, Roberto; Gallina, Luca; and Tessari, Pino, to Nordica S.p.A. Lever, particularly for ski boots. 5,485,688, Cl. 36-117.000.
Gosteli, Jacques: *See*—
Griffiths, Gareth; Imwinkelried, René; and Gosteli, Jacques, 5,486,617, Cl. 548-333.500.
Goszczynski, Stefan: *See*—
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Goto, Hideji: *See*—
Hazama, Junji; Yanagihara, Masamitsu; Goto, Hideji; and Murakami, Masaichi, 5,486,896, Cl. 355-71.000.
Götschi, Erwin: *See*—
Arisawa, Mikio; Götschi, Erwin; Hebeisen, Paul; Kamiyama, Tsutomu; Link, Helmut; Masciadri, Raffaello; Shimada, Hisao; and Watanabe, Junko, 5,486,466, Cl. 435-106.000.
Gottehrer, Terry R.: *See*—
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Gove, Robert J.: *See*—
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Graber, Wendy K. F.: *See*—
Samad, Tariq; Graber, Wendy K. F.; and Konar, Ahmet F., 5,486,996, Cl. 364-152.000.
Graebner, John E.: *See*—
Dautremont-Smith, William C.; Graebner, John E.; Jin, Sungho; and Katz, Avishay, 5,486,263, Cl. 216-33.000.
Graiver, Daniel: *See*—
Cabasso, Israel; and Graiver, Daniel, 5,486,590, Cl. 528-23.000.
Gralnick, Harvey R., to United States of America, Health and Human Services. Hybridomas and monoclonal antibodies that speifically bind to GPIB on platelets and inhibit the binding of thrombin to platelets. 5,486,361, Cl. 424-144.100.
Grande, Michael L.; Grushkin, Bernard; Young, Eugene F.; Lundy, Douglas A.; and Matalevich, Joseph R. E., to Xerox Corporation. Magnetic toner compositions with silica, strontium titanate and polyvinylidene fluoride. 5,486,443, Cl. 430-106.000.
Grant, Larry J.; Monnin, Raymond V.; and Scott, James W., to Owens-Corning Fiberglas Technology, Inc. Insulation assembly and method of making. 5,486,401, Cl. 428-125.000.
Grant, Marty J.; and Pinkerton, Steven J., to Emhart Glass Machinery Investments Inc. Shear mechanism for glass forming machine. 5,486,221, Cl. 65-163.000.
Grass America, Inc.: *See*—
Domenig, Georg, 5,485,656, Cl. 16-387.000.
Gray, Benjamin, to Sidekick Tools Inc. Steering drill bit while drilling a bore hole. 5,485,889, Cl. 175-61.000.
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Samra, Amarjit K., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Majesty's Government of the. Chiral liquid crystal compounds. 5,486,309, Cl. 252-299.600.
Gray, John M.: *See*—
Winters, John R.; Gray, John M.; and Tenney, Joel D., 5,486,344, Cl. 423-477.000.

Great Lakes Chemical Italia S.r.l.: *See*—
Broussard, Fabio; Adovasio, Mauro; Callierotti, Corrado; Taroni, Gianbattista; and Roncalli, José, 5,486,613, Cl. 546-181.000.
Green, David T., to United States Surgical Corporation. Safety trocar. 5,486,190, Cl. 606-184.000.
Green, Edward J., to Reese Enterprises, Inc. Roll-up floor mat. 5,486,392, Cl. 428-54.000.
Green, Geoffrey C., to British Aerospace PLC. Cutting tools of composite construction. 5,486,072, Cl. 407-32.000.
Green, John A. Holding tank for waste. 5,485,637, Cl. 4-483.000.
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Hamblen, David P., to Eastman Kodak Company. Gradial zone lens and method of fabrication. 5,486,951, Cl. 359-565.000.

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Hammerle, Mark K., to Kelsey-Hayes Company. Integral variable reluctance speed sensor. 5,486,758, Cl. 324-174.000.

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Hanson, Charles M.; Dudley, Dana; and Robinson, James E., to Texas Instruments Incorporated. Thermal imaging system with integrated thermal chopper. 5,486,698, Cl. 250-332.000.

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Hansson, Hans M., to Telefonaktiebolaget LM Ericsson. Hands-free module. 5,487,182, Cl. 455-90.000.

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Hara, Nobuyuki; Kawamura, Akira; and Matsui, Takeshi, to Sony Corporation. Glasses type display apparatus. 5,486,841, Cl. 345-8.000.

Harada, Kentaro, to Kabushiki Kaisha Toshiba. Image forming apparatus having paper feeding mechanism for feeding sheet from sheet a storage portion to an image forming portion. 5,486,910, Cl. 355-309.000.

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Jewell, John M.; Harbison, Barry B.; Aggarwal, Ishwar D.; and Bayya, Shyam S., 5,486,495, Cl. 501-10.000.

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Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Stohs, Miriam; Colley, James D.; and Hargrove, Oliver W., Jr., 5,486,342, Cl. 423-243.010.

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Lob, Charles J., 5,485,800, Cl. 114-204.000.

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Harris, Randall L., to Riverwood International Corporation. Wrap-around carrier with article heel lock. 5,485,915, Cl. 206-147.000.

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Katsuoka, Kyuji; Harumiya, Noriho; Hashizume, Tadahiro; and Kitahara, Tadashi, 5,486,497, Cl. 501-95.000.

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Kay, Stephen R.; Billias, Athan; Igoshi, Yoshiyuki; and Hashida, Naoki, 5,486,647, Cl. 84-635.000.

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Lynum, Steinar; Haugsten, Kjell; Hox, Ketil; and Hugdahl, Jan, 5,486,674, Cl. 219-121.520.

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Hay, Andrew G., to Stamet, Inc. Apparatus with improved inlet and method for transporting and metering particulate material. 5,485,909, Cl. 198-642.000.

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Haynes, Don A., to Haynes-Miller, Inc. Protective shield for hypodermic syringe. 5,486,163, Cl. 604-192.000.

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Caplan, Arnold I.; and Haynesworth, Stephen E., 5,486,359, Cl. 424-93.700.

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Roberto, Oscar E.; and Maxim, Marc A., 5,486,414, Cl. 428-334.000.

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Dierdorf, Hans-Rolf, 5,486,024, Cl. 285-294.000.

Herberts GmbH: *See—*
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Herman, Patricia L.: *See—*
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Freeman, Paul R. W., 5,487,135, Cl. 395-75.000.
Greenstein, Michael; Melton, Hewlett E., Jr.; and Yeung, King-Wah W., 5,485,843, Cl. 128-661.090.
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Colleran, Stephen A.; Pawlicki, Jeffrey J.; and Higgins, John O., Jr., 5,486,118, Cl. 439-374.000.

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Hill, John P., to United Technologies Automatove, Inc. Balanced RF oscillator and transmitter. 5,486,793, Cl. 331-56.000.

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Hinshaw, Howard G.: *See*—
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Hira, Takaaki: *See*—
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Hirama, Hideo, to Seiko Instruments Inc. Micromotor. 5,486,728, Cl. 310-40.0MM.

Hirano, Hirofumi; Hasegawa, Koh; Inoue, Hiroyuki; Bekki, Toshihiko; and Ikado, Masaharu, to Canon Kabushiki Kaisha. Automatic sheet feeding apparatus. 5,485,991, Cl. 271-121.000.

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Hirao, Noriyoshi: *See*—
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Hirose, Katsuhiko; Tate, Takao; Nakamura, Norihiko; Sato, Takeshi; Iwahashi, Kazuhiro; Kamoshita, Shinji; and Yamanaka, Akihiro, to Toyota Jidosha Kabushiki Kaisha. Fuel injection controller for use in an internal combustion engine. 5,485,822, Cl. 123-501.000.

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Hiroshima, Minoru: *See*—
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Hitachi Chemical Co., Ltd.: *See*—
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Hock, Terrence F., to University Corporation For Atmospheric Research. Low cost telemetry receiving system. 5,486,835, Cl. 342-359.000.

Hodge, W. Andrew. Femoral preparation instrumentation system and method. 5,486,178, Cl. 606-82.000.

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Hoechst Celanese Corporation: *See*—
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Hoffend, Thomas R.: *See*—
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Hofmann, Jörg; Knetsch, Harald; Liebich, Kurt; Opper, Reinhold; Wiessler, Hans; and Bauer, Alois, to Emhart Inc. Process of and machinery for joining two metal sheets by welding. 5,486,678, Cl. 219-127.000.

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Hogle, Richard: *See—*
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Hohfeld, Egon. Device for slitting strip metal. 5,485,974, Cl. 242-525.600.

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Holden, Homer N.: *See—*
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Holdsworth, David W.; Drangova, Maria; and Fenster, Aaron, to University Hospital (London) Development Corporation. Pulse-injector for quantitative angiographic blood-flow measurements. 5,485,831, Cl. 128-654.000.

Holland, John A., to VAX Appliances Ltd. Suction cleaning head. 5,485,652, Cl. 15-322.000.

Holland, Richard J.: *See—*
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Homelite Inc.: *See—*
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Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Horimura, Hiroyuki, 5,485,876, Cl. 164-122.000.
Iwasawa, Kenjiroh; and Abe, Hiroya, 5,487,003, Cl. 364-424.100.
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Honda, Masaaki; and Ihara, Tomohiko, to Sumitomo Electric Industries, Ltd. Exhaust gas purification filter. 5,486,220, Cl. 55-487.000.

Honda, Shoichiro: *See—*
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Honeywell, Inc.: *See—*
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Hong, Gary, to United Microelectronics Corporation. Trench EEPROM with tunnel oxide in trench. 5,486,714, Cl. 257-321.000.

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Hopkins, Keith: *See—*
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Hopper, James F.: *See—*
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Horan, Patrick J.; Balch, Richard A.; Elmore, David D.; and Legere, Joseph R., to General Electric Company. Electronic meter having anti-tampering magnetic shield. 5,486,755, Cl. 324-110.000.

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Horn, Dieter; Lueddecke, Erik; Gierulski, Alfred; Kroehl, Thomas; and Lorencak, Primoz, to BASF Aktiengesellschaft. Method for determining resin particles in paper stocks. 5,486,904, Cl. 356-73.000.

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Drab, John J.; and Ramer, O. Glenn, 5,487,030, Cl. 365-145.000.
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Imai, Hitoshi; Sugiura, Muneharu; and Hoashi, Katsutoshi, 5,486,948, Cl. 359-462.000.
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Im, Changsik, to Samsung Electronics Co., Ltd. Base current-control circuit of an output transistor. 5,486,781, Cl. 327-108.000.
Imai, Hitoshi; Sugiura, Muneharu; and Hoashi, Katsutoshi, to Canon Hanbai Kabushiki Kaisha; Canon Kabushiki Kaisha; and Ikegami Tsushinki Co., Ltd. Stereo image forming apparatus having a light deflection member in each optical path. 5,486,948, Cl. 359-462.000.
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Mandanis, Georges, 5,485,887, Cl. 173-17.000.

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Fey, George T., 5,486,346, Cl. 423-594.000.

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Morehouse, James H.; Furay, David M.; Volk, Steven B.; Utenick, Michael R.; Dunckley, James A.; Blagaila, John H.; Hopper, James F.; and Klein, Thomas A., 5,486,964, Cl. 360-105.000.

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Keeney, Stephen N.; and Atwood, Gregory E., 5,487,033, Cl. 365-185.190.
Park, Chin S.; Holler, Mark A.; Diamond, Jay M.; The, Siang-Chun; Santoni, Umberto; and Buckmann, Kenneth R., 5,487,133, Cl. 395-27.000.

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Partovi, Hamid; and Draper, Donald A., 5,487,025, Cl. 364-788.000.

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Ackley, H. Sprague, 5,486,689, Cl. 235-463.000.

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Amelina, Iam R.; Mooney, David M.; and Stoodley, Kevin A., 5,487,158, Cl. 395-375.000.
Bass, Brian M.; Ku, Edward H.; Lin, Bou-Chung; and Sanaye, Simin H., 5,487,170, Cl. 395-732.000.
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Chan, Francis H., 5,486,782, Cl. 327-112.000.
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Finney, Damon W.; and Rayfield, Michael J., 5,487,092, Cl. 375-354.000.
Galand, Claude; and Lebizay, Gerald, 5,487,064, Cl. 370-60.000.
Geiner, Robert V.; and Jensen, David L., 5,487,168, Cl. 395-650.000.
Hassner, Martin A.; Lang, Luke C. K.; Ouchi, Norman K.; and Schwiegelshohn, Uwe, 5,487,077, Cl. 371-40.100.
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Kirchhofer, Richard; and Wagar, Bruce A., 5,487,164, Cl. 395-600.000.
Knight, Stephen E.; Luce, Stephen E.; and McDevitt, Thomas L., 5,486,267, Cl. 156-659.110.
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Drewry, John R.; Collins, Michael; and Korpal, Ashwani K., 5,487,155, Cl. 395-311.000.

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Sprecker, Mark A.; Weiss, Richard A.; and Hanna, Marie R., 5,486,502, Cl. 512-21.000.

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Sykes, Christopher C., 5,486,041, Cl. 312-111.000.

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McCallum, R. William; and Branagan, Daniel J., 5,486,240, Cl. 148-102.000.

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Aida, Satoshi; Shibata, Mariko; Fujimoto, Katsuhiko; Ishibashi, Yoshiharu; Suzuki, Takuji; Sato, Kozo; and Itoh, Ayao, 5,485,839, Cl. 128-653.100.

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Beck, Erhard; and Dinkel, Dieter, 5,486,040, Cl. 303-113.200.
Thiel, Rudolf; Klimt, Ulrich; and Doell, Andreas, 5,485,899, Cl. 188-73.100.
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Borg, Torolf; and Strinning, Per E., 5,486,092, Cl. 415-225.000.
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Comer, Keith; Elsasser, Gary; and Iwakiri, Takano, 5,486,846, Cl. 345-168.000.
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IXYS Corporation: *See*—
Zommer, Nathan, 5,486,715, Cl. 257-341.000.
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Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Samra, Amarjit K., 5,486,309, Cl. 252-299.600.
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Peterson, Brian K.; and Jackson, Andrew, 5,485,895, Cl. 184-6.220.
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Le, Thu A.; Bruker, Izi; Luscombe, Brian H.; and Jamiolkowski, Dennis D., 5,486,197, Cl. 606-232.000.
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Organek, Gregory J.; Preston, David M.; and Janson, David A., 5,485,904, Cl. 192-35.000.
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Martin, Roger L., 5,485,914, Cl. 206-145.000.
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Flood, Gary M.; Johnson, David M.; and Marek, Henry S., 5,486,137, Cl. 451-540.000.
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Jones, Robert E., Jr., to International Business Machines Corporation. Integrated transducer-suspension structure for longitudinal recording. 5,486,963, Cl. 360-104.000.

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Matsushita, Shigenori; Zhang, Shu H.; Yamamoto, Shigeru; Nishita, Satoru; and Nakata, Kazushi, 5,485,885, Cl. 172-7.000.

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Takeuchi, Masamitsu; Ishihama, Kazuyoshi; and Ikei, Kazunori, 5,485,864, Cl. 137-118.000.

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Yamazaki, Nobuto; and Kyomasu, Ryuichi, 5,486,733, Cl. 310-323.000.

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Aida, Satoshi; Shibata, Mariko; Fujimoto, Katsuhiko; Ishibashi, Yoshiharu; Suzuki, Takuji; Sato, Kozo; and Itoh, Ayao, 5,485,839, Cl. 128-653.100.
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Iimori, Akiro; and Morihara, Kazushige, 5,486,899, Cl. 355-203.000.
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Tsai, Wen-Hung, 5,486,823, Cl. 341-22.000.
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Kimura, Kazuya; Ito, Masafumi; Mizutani, Hideki; Makino, Yoshihiro; Hirota, Suguru; Ozeki, Taro; Kato, Keiichi; and Kayukawa, Hiroaki, 5,486,098, Cl. 417-222.200.

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Shiga, Tohru; Hirose, Yoshiharu; Okada, Akane; and Kurauchi, Toshio, 5,486,560, Cl. 524-401.000.

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Fung, Daniel Y. C., 5,486,367, Cl. 426-7.000.
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Hirano, Koki; Ohki, Ryuichi; and Kobayashi, Yutaka, 5,486,561, Cl. 524-451.000.

Kodaiku, Masanori: *See*—
Itagaki, Akinari; Azechi, Syuuichi; Kuwata, Satoshi; Tsutsumi, Yousuke; and Kodaiku, Masanori, 5,486,549, Cl. 523-161.000.

Kodama, Masafumi, to Mitsubishi Denki Kabushiki Kaisha. Video tape recorder in which a video signal to be displayed is produced by utilizng a single main magnetic head. 5,486,955, Cl. 360-10.300.

Koenck, Steven E.; Austin, Rickey G.; and Boatwright, Darrell L., to Norand Corp. Computerized data terminal with switchable memory address for start-up and system control instructions. 5,487,161, Cl. 395-442.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Schneider, Georg; and Röthlein, Ewald, 5,485,785, Cl. 101-487.000.

Koenig, David J., to Onan Corporation. Electronic trimming voltage regulator. 5,486,751, Cl. 322-86.000.

Koenig, Reinhard: *See*—
Boelke, Tim; Kling, Lothar; and Koenig, Reinhard, 5,486,530, Cl. 514-347.000.

Koepke, Earl H.: *See*—
Koepke, Marcus C.; and Koepke, Earl H., 5,486,035, Cl. 297-320.000.

Koepke, Marcus C.; and Koepke, Earl H. Occupant weight operated chair. 5,486,035, Cl. 297-320.000.

Koether, Bernard; Koether, George F., II; and Ubert, Harald, to Food Automation Service Techniques, Inc. Rotisserie oven. 5,485,780, Cl. 99-419.000.

Koether, George F., II: *See*—
Koether, Bernard; Koether, George F., II; and Ubert, Harald, 5,485,780, Cl. 99-419.000.

Kohara, Minoru: *See*—
Saiuchi, Kazuo; Kohara, Minoru; Yamada, Kunikazu; and Kanki, Kazuhiko, 5,486,941, Cl. 359-81.000.

Kohno, Takashi: *See*—
Yoshida, Takeshi; Amano, Hideaki; Kohno, Takashi; Mori, Kenji; Yoshida, Takashi; and Hirai, Hiromu, 5,486,965, Cl. 360-106.000.

Kohsaka, Jun: *See*—
Niikawa, Tetsuji; Nakamura, Hiromu; Naiki, Toshio; and Kohsaka, Jun, 5,486,954, Cl. 359-818.000.

Kohyama, Naoyuki: *See*—
Kojima, Tatsuru; and Kohyama, Naoyuki, 5,486,656, Cl. 174-261.000.

Koike, Michiro: *See*—
Takeda, Atsushi; Koike, Michiro; Saito, Hironobu; and Katsumi, Toru, 5,486,905, Cl. 355-215.000.

Koito Manufacturing Co., Ltd.: *See*—
Yamashita, Masayasu; and Toda, Atsushi, 5,486,740, Cl. 315-308.000.

Koiwa, Mitsuru: *See*—
Shimizu, Takeshi; Taruya, Masaaki; Murata, Shigemi; Koiwa, Mitsuru; and Maekawa, Toshio, 5,485,825, Cl. 123-634.000.

Koizumi, Noboru; Haneda, Satoshi; Ichihara, Yoshiyuki; Hasebe, Takashi; and Niitsuma, Tetsuya, to Konica Corporation. Digital image forming apparatus using subdivided pixels. 5,486,927, Cl. 358-298.000.

Kojima, Akio: *See*—
Shoshi, Masayuki; Shimoda, Masakatsu; Konishi, Akiko; Kawahara, Megumi; Kojima, Akio; Suzuki, Tetsuro; and Yoshikawa, Masao, 5,486,438, Cl. 430-58.000.

Kojima, Ryo; Sato, Yoshiro; and Nagasawa, Takeshi, to Nitto Boseki Co., Ltd. Method of quantitative assay for 1,5-anhydroglucitol. 5,486,458, Cl. 435-14.000.

Kojima, Shin-ichi: *See*—
Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; Kojima, Shin-ichi; Minney, Jack L.; Oishi, Motohiro; Fukumura, Keiji; and Nakanishi, H., 5,487,038, Cl. 365-191.000.

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Itoi, Shigeru; Yamaji, Michio; and Kojima, Tetsuya, 5,485,984, Cl. 251-331.000.

Kojima, Yoshikazu: *See*—
Saito, Yutaka; Osanai, Jun; Kojima, Yoshikazu; and Kamiya, Masaaki, 5,486,716, Cl. 257-360.000.
Takahashi, Kunihiro; Kojima, Yoshikazu; Takasu, Hiroaki; Matsuyama, Nobuyoshi; Niwa, Hitoshi; Yoshino, Tomoyuki; and Yamazaki, Tsuneo, 5,486,708, Cl. 257-59.000.

Kokubo, Nobuyuki; and Ikeda, Kazuya, to Mitsubishi Denki Kabushiki Kaisha. SRAM with small planar layout. 5,486,717, Cl. 257-385.000.

Komakine, Shigeo: *See*—
Ochiai, Kuniaki; and Komakine, Shigeo, 5,485,663, Cl. 29-25.350.

Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; Kojima, Shin-ichi; Minney, Jack L.; Oishi, Motohiro; Fukumura, Keiji; and Nakanishi, H., to Creative Integrated Systems, Inc.; and Rocoh Company, Ltd. Method for read cycle interrupts in a dynamic read-only memory. 5,487,038, Cl. 365-191.000.

Komatsubara, Satoru: *See*—
Takenaka, Eiji; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Sugiyama, Toshihiro; Yamanaka, Tetsuo; Murakami, Eisaku; and Komatsubara, Satoru, 5,486,909, Cl. 355-259.000.

Komazaki, Tomokazu; Gunji, Katsuhiko; Noguchi, Kazushige; and Tanoie, Kunihiro, to Oki Electric Industry Co., Ltd. Strip line filter and duplexer filter using the same. 5,486,799, Cl. 333-134.000.

Komori, Naoki; Morita, Akio; and Suzuki, Katsuaki, to Honda Giken Kogyo Kabushikikaisha. Method and apparatus for detecting faults in a computer network. 5,487,148, Cl. 395-182.020.

Komorowski, Karl J.: *See*—
LaPointe, Larry P.; Saul, Jonathan R.; and Komorowski, Karl J., 5,485,979, Cl. 248-188.200.

Konar, Ahmet F.: *See*—
Samad, Tariq; Graber, Wendy K. F.; and Konar, Ahmet F., 5,486,996, Cl. 364-152.000.
Kondou, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Electronic control device for an internal combustion engine. 5,485,824, Cl. 123-520.000.
Konica Corporation: *See*—
Fujii, Yozo; Moriguchi, Hiroyuki; Ikunami, Yoshikazu; Matsunawa, Masahiko; Tamura, Akihiko; Yasuda, Kazuo; Miwa, Tadashi; Horiuchi, Tatsumi; Kishimoto, Tadao; Fujimaki, Yoshihide; Takagiwa, Hiroyuki; and Tamura, Takashi, 5,486,898, Cl. 355-200.000.
Fukuchi, Masakazu; Morita, Shizuo; Kayano, Shizuo; and Yoshino, Kunihisa, 5,486,901, Cl. 355-208.000.
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Tosaka, Yasuo; and Sasagawa, Masayuki, 5,486,450, Cl. 430-538.000.
König, Elisabeth, heiress: *See*—
König, Helmut, deceased; and König, Elisabeth, heiress, 5,486,048, Cl. 366-76.800.
König, Helmut, deceased; and König, Elisabeth, heiress. Apparatus for treating dough. 5,486,048, Cl. 366-76.800.
Konishi, Akiko: *See*—
Shoshi, Masayuki; Shimoda, Masakatsu; Konishi, Akiko; Kawahara, Megumi; Kojima, Akio; Suzuki, Tetsuro; and Yoshikawa, Masao, 5,486,438, Cl. 430-58.000.
Konishi, Kazuki: *See*—
Suzuki, Kenji; Ishizaki, Akira; Ohtaka, Keiji; Suda, Yasuo; Fukahori, Hidehiko; Nagano, Akihiko; Konishi, Kazuki; and Tsunekawa, Tokuichi, 5,486,892, Cl. 354-402.000.
Konno, Toshio: *See*—
Negishi, Ichiro; Suzuki, Tetsuji; Koyama, Fujiko; Uchiyama, Yuji; Bonde, Hiroyuki; Konno, Toshio; Takahashi, Ryusaku; and Shou, Toshiaki, 5,486,878, Cl. 348-757.000.
Konrad, Charles E.; and Boothe, Richard W., to General Electric Company. Method and apparatus for improved efficiency in a pulse-width-modulated alternating current motor drive. 5,486,748, Cl. 318-811.000.
Kontopidis, George D.: *See*—
Rothschild, Ralph F.; Kontopidis, George D.; and Linton, Charles C., 5,487,102, Cl. 379-67.000.
Koolen, Johannes L. A.: *See*—
Krist, Johannes H. A.; Lapère, Martine R.; Wassink, Steven G.; and Koolen, Johannes L. A., 5,486,995, Cl. 364-149.000.
Kopet, Thomas G.: *See*—
Lew, Stephen D.; Luikuo, Gerry C.; and Kopet, Thomas G., 5,486,876, Cl. 348-719.000.
Korea Institute of Science and Technology: *See*—
Lee, Yong W.; Lee, Yeong S.; Yon, Chang S.; Suh, Jung W.; Lee, Chul H.; Lim, Yoong H.; and Yoo, Ick D., 5,486,630, Cl. 554-1.000.
Korg Incorporated: *See*—
Kay, Stephen R.; Billias, Athan; Igoshi, Yoshiyuki; and Hashida, Naoki, 5,486,647, Cl. 84-635.000.
Korpal, Ashwani K.: *See*—
Drewry, John R.; Collins, Michael; and Korpal, Ashwani K., 5,487,155, Cl. 395-311.000.
Koscica, Thomas E.; and Drach, William C., to United States of America, Army. High voltage direct current power supply with feedback control and circuit protection. 5,486,992, Cl. 363-21.000.
Koscica, Thomas E.: *See*—
Drach, William C.; Babbitt, Richard W.; and Koscica, Thomas E., 5,487,014, Cl. 364-481.000.
Koser, James R.: *See*—
Northey, William A.; and Koser, James R., 5,486,115, Cl. 439-108.000.
Koshi, Yutaka: *See*—
Kimura, Shunichi; Koshi, Yutaka; and Kamizawa, Koh, 5,487,119, Cl. 382-239.000.
Kosinski, Sandra G.: *See*—
Kammlott, Guenther W.; Kosinski, Sandra G.; Krause, John T.; and Riggs, Richard S., 5,487,125, Cl. 385-96.000.
Koskenmaki, David C.; and Calhoun, Clyde D., to Minnesota Mining and Manufacturing Company. Patterned array of uniform metal microbeads. 5,486,427, Cl. 428-546.000.
Koval, Michael J.: *See*—
Dinallo, Chris A.; Koval, Michael J.; Lawton, William W.; Paulat, Martin J., Jr.; Tyler, John G.; Winters, Scott L.; and Allran, Gary G., 5,487,167, Cl. 395-650.000.
Kowalczyk, Thomas M.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kulak, Richard E.; and Barrett, David W., to Otis Elevator Company. Rotary elevator car door coupling. 5,485,896, Cl. 187-330.000.
Koyama, Fujiko: *See*—
Negishi, Ichiro; Suzuki, Tetsuji; Koyama, Fujiko; Uchiyama, Yuji; Bonde, Hiroyuki; Konno, Toshio; Takahashi, Ryusaku; and Shou, Toshiaki, 5,486,878, Cl. 348-757.000.
Koyama, Kuniaki, to NEC Corporation. Semiconductor device having a capacitor. 5,486,713, Cl. 257-310.000.
Koyamatsu, Anthony H.: *See*—
Mummery, Herbert L., deceased; Koyamatsu, Anthony H.; and Young, Michael B., 5,485,972, Cl. 242-386.000.
Koyano, Shinji: *See*—
Oda, Yoshimasa; and Koyano, Shinji, 5,485,910, Cl. 198-690.100.
Kraft Foods, Inc.: *See*—
Martin, Robert W.; Miller, Mark S.; and Surber, Kevin J., 5,486,372, Cl. 426-565.000.
Mason, Charles R.; Nayyar, Dalip K.; and Coleman, Edward C., 5,486,369, Cl. 426-321.000.
Kraik, Newell P. Wire wrapped composite spiral hose and method. 5,485,870, Cl. 138-122.000.
Kramer, Dennis A.: *See*—
Periou, Pierre; Bonnefond, Xavier; Kramer, Dennis A.; and Malinowski, Mark E., 5,486,724, Cl. 307-10.100.
Kramer, John P.: *See*—
Otting, Marcia J.; and Kramer, John P., 5,486,843, Cl. 345-35.000.
Kramer, Roland K.: *See*—
de Boer, Rudolf; Kramer, Roland K.; and McKernan, Ronald W., 5,486,368, Cl. 426-41.000.
Kramer, Steven W.: *See*—
Lee, Len F.; Penning, Thomas D.; and Kramer, Steven W., 5,486,534, Cl. 514-406.000.
Kramer, Valentin; and Ziegler, Gerd. Membrane module to remove gaseous substances from a gas stream. 5,486,475, Cl. 435-266.000.
Kramer, Werner: *See*—
Enhsen, Alfons; Glombik, Heiner; Kramer, Werner; and Wess, Günther, 5,486,626, Cl. 552-521.000.
Krause, John T.: *See*—
Kammlott, Guenther W.; Kosinski, Sandra G.; Krause, John T.; and Riggs, Richard S., 5,487,125, Cl. 385-96.000.
Kravitz, Jeff K.: *See*—
Choy, Michael M.; Green, Paul E., Jr.; Hall, William E.; Janniello, Frank J.; Kravitz, Jeff K.; Liu, Karen; Ramaswami, Rajiv; and Tong, Franklin F., 5,487,120, Cl. 385-24.000.
Krenz, Eric L.: *See*—
Kuffner, Stephen L.; Carney, Scott N.; and Krenz, Eric L., 5,486,836, Cl. 343-700.0MS.
Kricka, Larry J.: *See*—
Wilding, Peter; and Kricka, Larry J., 5,486,335, Cl. 422-55.000.
Krieger, Cheryl D.: *See*—
Miller, Richard E.; Couch, Charlene R.; and Krieger, Cheryl D., 5,486,228, Cl. 106-22.00B.
Krishnamurthy, Ramachandran: *See*—
McKeigue, Kevin; and Krishnamurthy, Ramachandran, 5,486,318, Cl. 261-112.200.
Krist, Johannes H. A.; Lapère, Martine R.; Wassink, Steven G.; and Koolen, Johannes L. A., to Dow Benelux N.V. System for real time optimization. 5,486,995, Cl. 364-149.000.
Kroehl, Thomas: *See*—
Horn, Dieter; Lueddecke, Erik; Gierulski, Alfred; Kroehl, Thomas; and Lorencak, Primoz, 5,486,904, Cl. 356-73.000.
Kroener, Hubertus; Schupp, Eberhard; Wistuba, Eckehardt; Aydin, Oral; Schwarzenbach, Elmar; and Schnell, Klaus, to BASF Aktiengesellschaft. Adhesives based on polyvinyl ether copolymers. 5,486,586, Cl. 526-332.000.
Kroetsch, Charles E.: *See*—
Brown, Louis R.; Steffens, Charles E., Jr.; Kroetsch, Charles E.; and Robbins, Delmar H., 5,485,758, Cl. 73-865.800.
Krug, Edward C.: *See*—
Marr, J. Joesph; Krug, Edward C.; Berens, Randolph L.; and Ke, Ou-Yang, 5,486,535, Cl. 514-450.000.
Krumkalns, Eriks V.: *See*—
Edie, Ronnie G.; Hackler, Ronald E.; and Krumkalns, Eriks V., 5,486,516, Cl. 514-232.800.
Kruskopf, David J.: *See*—
Stevens, Timothy J.; and Kruskopf, David J., 5,485,691, Cl. 37-302.000.
Ku, Edward H.: *See*—
Bass, Brian M.; Ku, Edward H.; Lin, Bou-Chung; and Sanaye, Simin H., 5,487,170, Cl. 395-732.000.
Kubota, Norikazu, to Sanyo Electric Co., Ltd. Gas burner. 5,486,108, Cl. 431-181.000.
Kubota, Takashi: *See*—
Nakamura, Shinichi; and Kubota, Takashi, 5,486,075, Cl. 408-230.000.
Kück, Heinz: *See*—
Gehner, Andreas; Hess, Günther; Kück, Heinz; and Vogt, Holger, 5,486,851, Cl. 347-258.000.
Kuder, Robert P., II: *See*—
Cavaliere, William A.; Kuder, Robert P., II; and Wu, Jin J., 5,486,132, Cl. 451-75.000.
Kudo, Masaki; and Ohno, Kyoko, to Yamaha Corporation. Electronic musical instrument having a waveform memory for storing variable length waveform data. 5,486,644, Cl. 811-604.000.
Kudou, Tosihisa: *See*—
Igarashi, Osamu; Naitou, Akira; Tougane, Hikohiro; Tsutsumi, Hironobu; and Kudou, Tosihisa, 5,486,803, Cl. 336-92.000.
Kuehn, Michael: *See*—
Treiber, Juergen; Kuehn, Michael; Rollwage, Mathias; Trachte, Dietrich; and Strohl, Willi, 5,486,087, Cl. 415-55.100.
Kuffner, Stephen L.; Carney, Scott N.; and Krenz, Eric L., to Motorola, Inc. Method, dual rectangular patch antenna system and radio for providing isolation and diversity. 5,486,836, Cl. 343-700.0MS.
Kühn, Eberhard: *See*—
Hammerschmidt, Albert; Kühn, Eberhard; and Schmidt, Erwin, 5,486,447, Cl. 430-197.000.
Kuhns, Abe B., to E-Z Trail, Inc. Vehicle chassis. 5,486,020, Cl. 280-789.000.
Kulak, Richard E.: *See*—

Kowalczyk, Thomas M.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kulak, Richard E.; and Barrett, David W., 5,485,896, Cl. 187-330.000.

Kulan, Stephen: *See*—
Brennan, William D.; Kulan, Stephen; Hyslop, Ronald T.; Ellis, Johnny; Gregory, Ray; Penner, Larry; and Hays, James K., 5,485,771, Cl. 82-1.110.

Kumar, Ravi; Scharpf, Eric W.; and Woods, Charles M., to Air Products and Chemicals, Inc. Integrated process for purifying and liquefying a feed gas mixture with respect to its less strongly adsorbed component of lower volatility. 5,486,227, Cl. 95-41.000.

Kumsan Material Co., Ltd.: *See*—
An, Ki Ju, 5,486,229, Cl. 106-36.000.

Kundert, James W., to Dimock, Andrew G. Storage and display holder. 5,485,926, Cl. 211-40.000.

Kuo, Lawrence C.: *See*—
Darke, Paul L.; Hall, Dawn L.; and Kuo, Lawrence C., 5,486,470, Cl. 435-219.000.

Kuraray Co., Ltd.: *See*—
Kawashima, Mitsunobu; and Omura, Ikuo, 5,486,544, Cl. 522-17.000.
Ohmory, Akio; Sano, Tomoyuki; Satoh, Masahiro; Naramura, Syunpei; Kobayashi, Satoru; and Sekiya, Yosuke, 5,486,418, Cl. 428-397.000.

Kurata, Yasuhiro: *See*—
Shinbara, Kaoru; Kurata, Yasuhiro; and Sawamura, Masashi, 5,485,644, Cl. 15-21.100.

Kurauchi, Toshio: *See*—
Shiga, Tohru; Hirose, Yoshiharu; Okada, Akane; and Kurauchi, Toshio, 5,486,560, Cl. 524-401.000.

Kurita, Shinichi: *See*—
Saito, Jun; and Kurita, Shinichi, 5,487,059, Cl. 369-116.000.

Kuriyama, Toshihide, to NEC Corporation. Method of measuring ingredients in liquid. 5,486,478, Cl. 436-52.000.

Kuroda, Kenichi, to Hitachi, Ltd. Semiconductor memory device having a non-volatile memory composed of ferroelectric capacitors which are selectively addressed. 5,487,029, Cl. 365-145.000.

Kusakabe, Tatsuya: *See*—
Shiraiwa, Norinobu; and Kusakabe, Tatsuya, 5,485,855, Cl. 128-774.000.

Kuster, Frank: *See*—
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Kuwata, Satoshi: *See*—
Itagaki, Akinari; Azechi, Syuuichi; Kuwata, Satoshi; Tsutsumi, Yousuke; and Kodaiku, Masanori, 5,486,549, Cl. 523-161.000.

Kvaerner Engineering AS: *See*—
Lynum, Steinar; Haugsten, Kjell; Hox, Ketil; and Hugdahl, Jan, 5,486,674, Cl. 219-121.520.

Kyomasu, Ryuichi: *See*—
Yamazaki, Nobuto; and Kyomasu, Ryuichi, 5,486,733, Cl. 310-323.000.

L&P Property Management Company: *See*—
Workman, Joe C., 5,485,640, Cl. 5-263.000.

La-Z-Boy Chair Company: *See*—
LaPointe, Larry P.; Saul, Jonathan R.; and Komorowski, Karl J., 5,485,979, Cl. 248-188.200.

Laabs, Timothy P.; Misner, Michael O.; Schulz, Richard H.; and Spencer, Elbert M., to Eastern Company, The. Key operated rotary plug and cylinder lock. 5,485,735, Cl. 70-358.000.

Lacey, Christopher, to Phase Metrics. Method and apparatus for measurement of roughness and hardness of a surface. 5,486,924, Cl. 356-357.000.

Lacey, David: *See*—
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Samra, Amarjit K., 5,486,309, Cl. 252-299.600.

Lacoste, Jean-Michel: *See*—
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Ladieu-Walton, Julie M.: *See*—
Atkins, Jean; Harris, Richard M.; Ladieu-Walton, Julie M.; and McChristian, David C., 5,487,107, Cl. 379-144.000.

Lafond, Luc. Insulated glass spacer with diagonal support. 5,485,710, Cl. 52-204.593.

Lai, Yu-Chin; and Valint, Paul L., Jr., to Bausch & Lomb Incorporated. Wettable silicone hydrogel compositions and methods for their manufacture. 5,486,579, Cl. 525-479.000.

Lakes, A. Dale, to Standard Register Company, The. Sealable web or sheet product. 5,486,436, Cl. 430-11.000.

Lalli, Eric W.: *See*—
Hamilton, Elizabeth M.; Lalli, Eric W.; Lubin, Cindy B.; Sparks, Wanda F.; and Waterland, Alfred F., III, 5,486,010, Cl. 277-1.000.

Lambert, Philip: *See*—
Godin, Gary; and Lambert, Philip, 5,486,016, Cl. 280-250.100.

Lammert, Michael D., to TRW Inc. Method of forming closely spaced metal electrodes in a semiconductor device. 5,486,483, Cl. 437-39.000.

Lamp, William G.; and Spitzer, Clarence J., to Eaton Corporation. Seal for cord passageway of power pod. 5,486,664, Cl. 200-297.000.

Lancto, Robert: *See*—
Sengupta, Louise; Ngo, Eric; Stowell, Steven; O'Day, Michelina; and Lancto, Robert, 5,486,491, Cl. 501-137.000.

Landes, Andreas: *See*—
Hagen, Helmut; Nilz, Gerhard; Walter, Helmut; and Landes, Andreas, 5,486,618, Cl. 548-362.100.

Lang, Luke C. K.: *See*—
Hassner, Martin A.; Lang, Luke C. K.; Ouchi, Norman K.; and Schwiegelshohn, Uwe, 5,487,077, Cl. 371-40.100.

Lange, David A., to Thomson Saginaw Ball Screw Company, Inc. Ball nut and screw assemblies and methods of attaching extensions or housings to the ball nuts thereof. 5,485,760, Cl. 74-459.000.

Lannes, Eric M., to Bradford White Corporation. Combined water heater and heat exchanger. 5,485,879, Cl. 165-70.000.

Lapère, Martine R.: *See*—
Krist, Johannes H. A.; Lapère, Martine R.; Wassink, Steven G.; and Koolen, Johannes L. A., 5,486,995, Cl. 364-149.000.

LaPointe, Larry P.; Saul, Jonathan R.; and Komorowski, Karl J., to La-Z-Boy Chair Company. Chair base. 5,485,979, Cl. 248-188.200.

Laporte Industries Limited: *See*—
Davies, Mary E.; Whittle, Mavis E.; Jones, William; and Mokaya, Robert, 5,486,499, Cl. 502-81.000.

Larson, Gary R.; Puschak, Caren A.; and Wood, Kurt A., to Rohm and Haas Company. Method for reducing microfoam in a spray-applied waterborne thermoset composition. 5,486,576, Cl. 525-375.000.

Larson, Ralph I.; and Phillips, Richard L., to Aavid Laboratories, Inc. Method of making a two-phase thermal bag component cooler. 5,485,671, Cl. 29-840.032.

Larsson, Jan A., to Ericsson GE Mobile Communications Inc. Arrangement for duplex transmission having transmitter power control. 5,487,179, Cl. 455-69.000.

Lasenby, Kyle D.; and Peecher, Barry S., to Minnesota Mining and Manufacturing Company. Packaging assembly. 5,485,918, Cl. 206-372.000.

Latham, James R.: *See*—
Mitchell, James D.; Alvarez, Vincent E.; Carty, Daniel T.; and Latham, James R., 5,486,212, Cl. 8-142.000.

Lathrop, Gregory A.: *See*—
Heinz, Daniel J.; Lathrop, Gregory A.; Caldwell, Lawrence W.; and Buzzeo, Pasquale, 5,486,152, Cl. 493-468.000.

Lau, Frederick L., to Switchcraft Inc. Environmental connector. 5,485,673, Cl. 29-883.000.

Lau, James C. K. Human powered ground vehicle. 5,486,015, Cl. 280-236.000.

Laubie, Michel: *See*—
Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; Descombes, Jean-Jacques; and Millan, Mark, 5,486,532, Cl. 514-374.000.

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Mason, Charles R.; Nayyar, Dalip K.; and Coleman, Edward C., to Kraft Foods, Inc. Process for preparing shelf-stable, intermediate-moisture potatoes. 5,486,369, Cl. 426-321.000.
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Matsui, Takeshi: *See*—
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Matsumae, Iwao: *See*—
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Matsushima, Yoshimasa; and Hagiwara, Toshimitsu, to Takasago International Corporation. Electrophotographic photoreceptor containing 1,4-bis(4,4-diphenyl-1,3-butadienyl)benzene derivative. 5,486,441, Cl. 430-74.000.
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Horie, Ryuji, 5,486,819, Cl. 340-905.000.
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Nakano, Nobuyuki; and Yasui, Nobuhiko, 5,487,116, Cl. 382-104.000.
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Takimoto, Akio; Wakemoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, 5,486,442, Cl. 430-78.000.
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Tomura, Yoshihiro; and Bessho, Yoshihiro, 5,485,949, Cl. 228-180.500.
Yuki, Koichiro; Hirai, Yoshihiko; Morimoto, Kiyoshi; Niwa, Masaaki; Yasui, Juro; Okada, Kenji; and Udagawa, Masaharu, 5,486,706, Cl. 257-25.000.
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Nagata, Toshihiko; Sano, Hiroshi; Yamawaki, Takayuki; and Matsushita, Kunitake, 5,486,054, Cl. 384-610.000.
Matsushita, Osami; Yoneyama, Mitsuho; Takahashi, Naohiko; Fukushima, Yasuo; Hiroshima, Minoru; Kaneki, Tadashi; Abe, Yoshiaki; and Sakanashi, Naofumi, to Hitachi, Ltd. Method and apparatus for controlling a magnetic bearing. 5,486,729, Cl. 310-90.500.
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Matsuya, Yasuyuki: *See*—
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Matsuyama, Nobuyoshi: *See*—
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Nozawa, Yusaku; Ohtsu, Wataru; Ichiki, Nobuhiko; Ino, Kazuyuki; Matsuzaki, Hiroshi; and Takahashi, Kinya, 5,485,724, Cl. 60-421.000.

Matsuzawa, Yoko: *See—*
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Matthias, Raymond: *See—*
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Matushita, Tetunori; Kamikawa, Hiroshi; Satoh, Hiroshi; Nomura, Kimiatus; and Tsurumi, Mitsuyuki, to Fuji Photo Film Co., Ltd. Multi-color heat-sensitive recording material utilizing multiple diazonium salt layers. 5,486,446, Cl. 430-156.000.

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Ghezzi, Paolo; and Maurelli, Alfonso, 5,486,486, Cl. 437-43.000.

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Suzuki, Seiichi; and Murayama, Keijiro, 5,485,711, Cl. 53-138.400.

Maxim, Marc A.: *See—*
Roberto, Oscar E.; and Maxim, Marc A., 5,486,414, Cl. 428-334.000.

May, Timothy J., to Reynolds Consumer Products Inc. Closure arrangement having a breakaway seal. 5,486,051, Cl. 383-200.000.

Mayeaux, Donald P., to A+ Corp. Compositions combinations of dessicants and vapor-corrosion inhibitors. 5,486,308, Cl. 252-194.000.

Mayer, Steven T.: *See—*
Contolini, Robert J.; Mayer, Steven T.; and Tarte, Lisa A., 5,486,234, Cl. 216-91.000.

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McCall, Robert B.: *See—*
Lin, Chiu-Hong; Haadsma-Svensson, Susanne R.; McCall, Robert B.; Romero, Arthur G.; Darlington, William H.; and Ennis, Michael D., 5,486,611, Cl. 546-62.000.

McCallum, R. William; and Branagan, Daniel J., to Iowa State University Research Foundation, Inc. Carbide/nitride grain refined rare earth-iron-boron permanent magnet and method of making. 5,486,240, Cl. 148-102.000.

McCandless, James C., to Navistar International Transportation Corp. Dimethyl ether powered engine. 5,485,818, Cl. 123-294.000.

McCarty, George P.: *See—*
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McCay, Steve W.; Harshman, Keith A.; Gillette, Stephen J.; and Wentzel, Dale A., to Bell & Howell Phillipsburg Company. Diverter and on-edge stacker. 5,485,989, Cl. 271-2.000.

McChristian, David C.: *See—*
Atkins, Jean; Harris, Richard M.; Ladieu-Walton, Julie M.; and McChristian, David C., 5,487,107, Cl. 379-144.000.

McClain, Kevin E.: *See—*
Helfrich, Kenneth J.; Stephens, Joseph C.; McClain, Kevin E.; and Lee, Brian, 5,486,866, Cl. 348-500.000.

McClure, David C., to SGS-Thomson Microelectronics, Inc. Multiplexing sense amplifier. 5,487,048, Cl. 365-207.000.

McClure, Wilbur F. Environmentally-protective combination burial/shipping/cremation case. 5,485,661, Cl. 27-7.000.

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McCullough, Edward D., to Rockwell International Corporation. System for mechanically stabilizing a bed of particulate media. 5,486,289, Cl. 210-289.000.

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Badley, Rickey D.; Benham, Elizabeth A.; and McDaniel, Max P., 5,486,584, Cl. 526-95.000.

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Knight, Stephen E.; Luce, Stephen E.; and McDevitt, Thomas L., 5,486,267, Cl. 156-659.110.

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Kalindjian, Sarkis B.; Broughton, Howard B.; Low, Caroline M. R.; McDonald, Iain M.; Hull, Robert A. D.; Shankley, Nigel P.; Buck, Ildiko M.; Steel, Katherine I. M.; and Davies, Jonathan M. R., 5,486,597. Cl. 530-331.000.

McDonald, James R.: *See—*
Cruden, Andrew J.; McDonald, James R.; Andonovic, Ivan; Allan, Kenneth; and Porrelli, Raymond A., 5,486,754, Cl. 324-96.000.

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Brouwer, Walter G.; Dalrymple, Alan W.; Felauer, Ethel E.; and McDonald, Paul T., 5,486,521, Cl. 514-274.000.

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McGinness, Edward A.; and McHone, Gary, to Harvard Corporation. Fluid filter collector with opposed ribs. 5,486,290, Cl. 210-323.200.

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Kowalczyk, Thomas M.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kulak, Richard E.; and Barrett, David W., 5,485,896, Cl. 187-330.000.

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Zygourakis, Kyriacos; Bednarczyk, John L.; McIntyre, Bradley W.; and Glacken, Michael W., 5,487,112, Cl. 382-6.000.

McKearn, John P.: *See—*
Liang, Chi-Dean; McKearn, John P.; Farah, John M., Jr.; and Mueller, Richard A., 5,486,539, Cl. 514-521.000.

McKeigue, Kevin; and Krishnamurthy, Ramachandran, to BOC Group, Inc., The. Liquid-vapor contact column. 5,486,318, Cl. 261-112.200.

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de Boer, Rudolf; Kramer, Roland K.; and McKernan, Ronald W., 5,486,368, Cl. 426-41.000.

McKrell, Richard L.: *See—*
Albert, Kevin F.; Doucet, Louis J.; and McKrell, Richard L., 5,485,992, Cl. 271-299.000.

McMillan, Larry D.: *See—*
Mihara, Takashi; Watanabe, Hitoshi; Yoshimori, Hiroyuki; Paz de Araujo, Carlos A.; and McMillan, Larry D., 5,487,032, Cl. 365-145.000.

McMills, Corey; Mattis, John; and Fremgen, Dieter, to Raychem Corporation. Coaxial cable connection protection system with multiple chambered, flexible-webbed shroud. 5,486,120, Cl. 439-521.000.

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Madison, Dennis S., 5,485,741, Cl. 73-4.00R.

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Hirshowitz, Bernard; Levy, Amnon; Gilat, Alexander R.; Rogel, Eitan; Stein, Jeffrey; and Borgia, Julian, 5,486,196, Cl. 606-218.000.

Medical College of Ohio: *See—*
Burnham, Jeffrey C.; Hageage, George J.; Jambard-Sweet, Douglas; and Hendricks, Judy, 5,486,459, Cl. 435-31.000.

Meditech, Ltd.: *See—*
Dunn, Michael, 5,486,506, Cl. 514-26.000.

Medtronic, Inc.: *See—*
Erickson, Donald J., 5,485,851, Cl. 128-716.000.
Kelm, Roger W.; and Herting, Vernon L., 5,486,215, Cl. 29-623.100.
Lindemans, Fredric W., 5,486,200, Cl. 607-5.000.

Meiler, Werner; and Deinhardt, Günther, to Siemens Aktiengelsellschaft. Plug and socket connection system for an electronic unit. 5,486,116, Cl. 439-347.000.

Meiring, David P.; and Maggert, Lynn R., to Electra Form, Inc. Blow mold clamp assembly. 5,486,103, Cl. 425-541.000.

Meise, William H.: *See—*
Walinsky, Paul; and Meise, William H., 5,486,192, Cl. 606-194.000.

Meiser, Dan: *See—*
Olson, Todd; Meiser, Dan; Steed, Gary; Huffman, Eric; Otten, Matthew; VanOverloop, Ronald; Powell, Darrel; Knodell, Thomas; Rhad, Edward; Chen, Ralph; and Cook, Robert, 5,485,947, Cl. 227-176.100.

Meissner, Jay P. Cover for pet carrier. 5,485,805, Cl. 119-17.000.

Melen, Roger D., to Canon Inc. Sequential extraction of strokes from a stroke based symbol apparatus and method. 5,487,118, Cl. 382-202.000.

Melton, Hewlett E., Jr.: *See—*
Greenstein, Michael; Melton, Hewlett E., Jr.; and Yeung, King-Wah W., 5,485,843, Cl. 128-661.090.
Verdonk, Edward; Greenstein, Michael; Melton, Hewlett E., Jr.; and Seyed-Bolorforosh, Mir S., 5,485,845, Cl. 128-662.060.

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Menzel, Jill: *See—*
Kerr, Richard C.; Damewood, John R.; Menzel, Jill; Thottathil, Paul; and Sandoja, Mohan L., 5,486,210, Cl. 8-115.660.

Merck & Co., Inc.: *See—*
Darke, Paul L.; Hall, Dawn L.; and Kuo, Lawrence C., 5,486,470, Cl. 435-219.000.

Merger, Roland: *See—*
Reinhardt, Robert; Reichelt, Helmut; and Merger, Roland, 5,486,609, Cl. 544-173.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Warshawsky, Alan M.; and Flynn, Gary A., 5,486,513, Cl. 514-214.000.
Weintraub, Philip M.; Gates, Cynthia A.; Angelastro, Michael R.; Curran, Timothy T.; and Johnston, J. O'Neal, 5,486,511, Cl. 514-178.000.

Merritt, Robert L. Hairbrush with electronic stroke counter. 5,485,646, Cl. 15-105.000.

Merving, Hans A. K. Tree treatment capsule with radially expanding shank portion. 5,485,698, Cl. 47-57.500.

Message, Olivier: *See—*
Beagley, Thomas; Kapaan, Hendrikus J.; Berryman, Leslie; and Message, Olivier, 5,486,053, Cl. 384-513.000.

Methode Electronics, Inc.: *See—*
Wandler, David, 5,486,124, Cl. 439-843.000.

Mettler-Toledo AG: *See—*
Philipp, Florian; Hautle, Alfred; Nuesch, Reto; and Straub, Beat, 5,485,684, Cl. 34-226.000.

Meur, Jean-Pierre, to Neopost Industrie. Postage meter including a safety locking circuit. 5,486,973, Cl. 361-170.000.

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Bajnógel, Judit; Blaskó, Gábor; Budai, Zoltán; Schmidt, Éva; Egyed, András; Fekete, Márton; Gacsályi, István; Gyertyán, István; Mezei, Tibor; Reiter née Esses, Kalára; Simig, Gyula; Szemerédi, Katalin; and Szirt née Kiszelly, Enikő, 5,486,528, Cl. 514-331.000.

Miceli, Gary L. Beach brush. 5,485,649, Cl. 15-184.000.

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Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., 5,487,159, Cl. 395-375.000.

Michal, Ronald J.; Steele, James R.; and Jones, Mark E., to Litton Systems, Inc. Fiber depolarizer using heated fiber coil and fusion splicer and two polarization preserving fibers and method. 5,486,916, Cl. 356-345.000.

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Montoya, Jean P., 5,486,099, Cl. 417-477.130.

MicroE: *See—*
Mitchell, Donald K.; and Thorburn, William G., 5,486,923, Cl. 356-356.000.

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Tuttle, John R.; and Tuttle, Mark E., 5,486,431, Cl. 429-66.000.

Micron Display Technology, Inc.: *See—*
Cathey, David A.; Hofmann, James J.; Dynka, Danny; and Stansbury, Darryl M., 5,486,126, Cl. 445-25.000.

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Sandhu, Gurtej S.; and Doan, Trung T., 5,486,129, Cl. 451-5.000.

Middleman, Lee M.; Pyka, Walter R.; Buhler, Michael; Poncet, Philippe; Van Dyk, Karl; and Jervis, James E., to Raychem Corporation. Device or apparatus for manipulating matter. 5,486,183, Cl. 606-127.000.

Mielke, Mark J.: *See—*
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Miesak, Edward J., to University of Central Florida. Optical signal coupling apparatus. 5,487,121, Cl. 385-39.000.

Mihara, Takashi; Watanabe, Hitoshi; Yoshimori, Hiroyuki; Paz de Araujo, Carlos A.; and McMillan, Larry D., to Symetrix Corporation; and Olympus Optical Co., Ltd. Method and apparatus for reduced fatigue in ferroelectric memory elements. 5,487,032, Cl. 365-145.000.

Mikami, Fumiyuki, to Canon Kabushiki Kaisha. Coding/decoding method and apparatus therefor. 5,486,828, Cl. 341-59.000.

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Bergmann, Klaus; Schwab, Jacques; and Frauenfelder, Martin, 5,486,151, Cl. 483-1.000.

Miles Inc.: *See—*
Hanseler, Ralph S.; and Healy, Michael D., 5,486,745, Cl. 318-561.000.

Milius, David J.: *See—*
Weltz, Richard; and Milius, David J., 5,487,088, Cl. 315-276.000.

Millan, Mark: *See—*
Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; Descombes, Jean-Jacques; and Millan, Mark, 5,486,532, Cl. 514-374.000.

Miller, Alan L.: *See—*
Watson, Will; Miller, Alan L.; Sundquist, Drew A.; Simpson, Roger T.; Ducklow, Diane K.; Beckerman, Joseph W.; and Showalter, Dan J., 5,485,894, Cl. 180-248.000.

Miller, Jack V. Parabolic fiber optic luminaire. 5,486,984, Cl. 362-32.000.

Miller, Kenneth: *See—*
Noell, John L. W.; Gaggar, Satish; McCarty, George P.; and Miller, Kenneth, 5,486,407, Cl. 428-215.000.

Miller, Lee S. Compact microwave antenna suitable for printed-circuit fabrication. 5,486,837, Cl. 343-780.000.

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Martin, Robert W.; Miller, Mark S.; and Surber, Kevin J., 5,486,372, Cl. 426-565.000.

Miller, Richard E.; Couch, Charlene R.; and Krieger, Cheryl D.., to Binney & Smith Inc. Washable color changing compositions. 5,486,228, Cl. 106-22.00B.

Miller, Roy R.; Clark, Brian K.; and Austin, Fred M., to Bulk Handling Systems, Inc. System and method for separating recycled debris. 5,485,925, Cl. 209-615.000.

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Miller, Wayne D.: *See—*
Freitas, Michael W.; and Miller, Wayne D., 5,486,185, Cl. 606-142.000.

Milligan, Charles A.: *See—*
Dodt, William C.; Gottehrer, Terry R.; and Milligan, Charles A., 5,487,171, Cl. 395-840.000.

Milliken Research Corporation: *See—*
Bylund, Don M.; Willauer, Howard C., Jr.; and Reynolds, James R., 5,486,385, Cl. 428-17.000.

Min, Kyungseol: *See—*
Kim, Heejo; Leem, Jongyong; Choi, Bongrak; Lee, Kyungsang; and Min, Kyungseol, 5,486,726, Cl. 307-120.000.

Mine, Katsutoshi; Nakamura, Takashi; and Sasaki, Motoshi, to Dow Corning Toray Silicone Company, Ltd. High purity polyhydrogen silsesquioxane resin for electronic coatings. 5,486,564, Cl. 524-588.000.

Minebea Co., Ltd.: *See—*
Nagata, Toshihiko; Sano, Hiroshi; Yamawaki, Takayuki; and Matsushita, Kunitake, 5,486,054, Cl. 384-610.000.

Miner, Philip E.: *See—*
Faryniarz, Joseph R.; and Miner, Philip E., 5,486,305, Cl. 252-162.000.

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Hayashi, Yutaka; Sato, Masaaki; and Maeyashiki, Yoshiki, 5,486,709, Cl. 257-110.000.

Minnesota Mining and Manufacturing Company: *See—*
Coleman, Patrick L.; Heilmann, Steven M.; Kangas, Steven L.; Rasmussen, Jerald K.; Rolando, Richard J.; and Stahl, Julie B., 5,486,358, Cl. 424-78.230.
Ford, Jeffrey E.; Chu, Ellen Y.; and Rude, Harold E., 5,486,219, Cl. 51-298.000.
Hansen, John C.; and Vogel, Herward A., 5,486,271, Cl. 204-59.00F.
Koskenmaki, David C.; and Calhoun, Clyde D., 5,486,427, Cl. 428-546.000.
Lasenby, Kyle D.; and Peecher, Barry S., 5,485,918, Cl. 206-372.000.
Smith, David P. H.; Leonard, Mark T.; and Swan, David W., 5,486,857, Cl. 347-224.000.
Vacca, Alberto; and Barletta, Paolo, 5,486,451, Cl. 430-569.000.

Minney, Jack L.: *See—*
Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; Kojima, Shin-ichi; Minney, Jack L.; Oishi, Motohiro; Fukumura, Keiji; and Nakanishi, H., 5,487,038, Cl. 365-191.000.

Minolta Camera Kabushiki Kaisha: *See—*
Shintani, Dai, 5,486,889, Cl. 354-202.000.

Minolta Co., Ltd.: *See—*
Kato, Takeshi, 5,485,990, Cl. 271-9.080.
Niikawa, Tetsuji; Nakamura, Hiromu; Naiki, Toshio; and Kohsaka, Jun, 5,486,954, Cl. 359-818.000.

Mints, William H.: *See—*
Joye, Donald D.; Mints, William H.; Clarke, John R.; and Wechgelaer, Peter, 5,485,834, Cl. 128-205.130.

Misaizu, Kouei; Honda, Shoichiro; and Ohnishi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Nyquist filter for digital modulation. 5,487,089, Cl. 375-296.000.

Mishra, Anupama; and Davis, Robert A., to Uniroyal Chemical Company, Inc.; and Uniroyal Chemical Ltd./Ltee. Fungicidal substituted azole derivatives. 5,486,533, Cl. 514-383.000.

Misner, Michael O.: *See—*
Laabs, Timothy P.; Misner, Michael O.; Schulz, Richard H.; and Spencer, Elbert M., 5,485,735, Cl. 70-358.000.

Misselyn, Anne-Marie; Mahieu, Marianne; and Erilli, Rita, to Colgate-Palmolive Co. Liquid cleaning compositions with grease release agent. 5,486,307, Cl. 252-174.240.

Misumi, Masaki: *See—*
Shinada, Tsunetoshi; Wada, Katsuo; Inoue, Haruo; Misumi, Masaki; and Saito, Akira, 5,486,543, Cl. 521-149.000.

Mitake, Haruko: *See—*
Takahashi, Kimikazu; Mitake, Haruko; and Fujimura, Shigeru, 5,487,144, Cl. 395-161.000.

Mitchell, Donald K.; and Thorburn, William G., to MicroE. Apparatus for detecting relative movement wherein a detecting means is positioned in the region of natural interference. 5,486,923, Cl. 356-356.000.

Mitchell, James D.; Alvarez, Vincent E.; Carty, Daniel T.; and Latham, James R., to Clorox Company, The. Cleaning through perhydrolysis conducted in dense fluid medium. 5,486,212, Cl. 8-142.000.

Mitchell, Lance S.; Nordhauser, Mary Ann; and Willis, Justin M., to Western Mining Corporation Limited. Pigment extenders. 5,486,233, Cl. 106-416.000.

Mitchnick, Mark; and O'Lenick, Anthony J., Jr., to Siltech Inc.; and Sunsmart Inc. Silicone polymers for the modification of zinc oxide. 5,486,631, Cl. 556-10.000.

Mitsubishi Chemical Corporation: *See—*
Fujita, Takashi; and Sugano, Toshihiko, 5,486,572, Cl. 525-247.000.
Ito, Michio; Sugawa, Satoshi; and Yanagida, Atsushi, 5,486,479, Cl. 436-533.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Arima, Hideaki, 5,486,712, Cl. 257-296.000.
Furutani, Kiyohiro; Yamauchi, Tadaaki; and Aoki, Makiko, 5,487,043, Cl. 365-203.000.
Hatakenaka, Makoto; Sakurai, Haruo; and Nagano, Hideo, 5,487,097, Cl. 377-20.000.
Igarashi, Osamu; Naitou, Akira; Tougane, Hikohiro; Tsutsumi, Hironobu; and Kudou, Tosihisa, 5,486,803, Cl. 336-92.000.
Kakimoto, Syoichi, 5,486,490, Cl. 437-129.000.
Kitano, Toshiaki, 5,486,710, Cl. 257-192.000.
Kodama, Masafumi, 5,486,955, Cl. 360-10.300.
Kokubo, Nobuyuki; and Ikeda, Kazuya, 5,486,717, Cl. 257-385.000.
Kondou, Katsuhiko, 5,485,824, Cl. 123-520.000.
Maekawa, Hitoshi, 5,487,099, Cl. 379-59.000.
Mizugaki, Shigeo, 5,487,157, Cl. 395-375.000.

Shimizu, Takeshi; Taruya, Masaaki; Murata, Shigemi; Koiwa, Mitsuru; and Maekawa, Toshio, 5,485,825, Cl. 123-634.000.
Wada, Tomohisa, 5,487,041, Cl. 365-200.000.
Mitsubishi Electric Industrial Co., Ltd.: *See*—
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Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Suzuki, Hidekazu; Harara, Mitsuhiko; and Tanaka, Tadao, 5,487,007, Cl. 364-424.050.
Mitsubishi Materials Corporation: *See*—
Miyata, Hiroshi; Chiba, Yoshio; and Noguchi, Osami, 5,486,671, Cl. 219-76.140.
Nakamura, Shinichi; and Kubota, Takashi, 5,486,075, Cl. 408-230.000.
Nakayama, Ryoji; Takeshita, Takuo; and Ishill, Yoshinari, 5,486,239, Cl. 148-101.000.
Nishihara, Akira; Nakamura, Akihiro; and Arakawa, Shigehiro, 5,486,420, Cl. 428-405.000.
Mitsubishi Semiconductor America, Inc.: *See*—
Blankenship, Dennis R., 5,486,785, Cl. 327-306.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Mizukuki, Tadahiko; Yabuuchi, Kouichi; Murakami, Shinichi; Sasakawa, Tomoyoshi; Shizuka, Kouhei; Kitagawa, Nobuhisa; and Hirose, Sumio, 5,486,396, Cl. 428-64.200.
Shinada, Tsunetoshi; Wada, Katsuo; Inoue, Haruo; Misumi, Masaki; and Saito, Akira, 5,486,543, Cl. 521-149.000.
Mitzlaff, James E.: *See*—
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Miura, Yasushi; Moriguchi, Haruhiko; Murayama, Yasushi; and Tanaami, Hideyuki, to Canon Kabushiki Kaisha. Thermal recording device with heat exchange. 5,486,849, Cl. 347-18.000.
Miwa, Tadashi: *See*—
Fujii, Yozo; Moriguchi, Hiroyuki; Ikunami, Yoshikazu; Matsunawa, Masahiko; Tamura, Akihiko; Yasuda, Kazuo; Miwa, Tadashi; Horiuchi, Tatsumi; Kishimoto, Tadao; Fujimaki, Yoshihide; Takagiwa, Hiroyuki; and Tamura, Takashi, 5,486,898, Cl. 355-200.000.
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Miyamoto, Ryosuke; Sekita, Makoto; and Takeda, Shohei, to Canon Kabushiki Kaisha. Electronic camera with dual exposure and selective recording. 5,486,861, Cl. 348-362.000.
Miyamoto, Takeshi; Okumura, Kouji; and Suzaki, Motohiro, to Sanyo Electric Co., Ltd. Fixing unit having heating roller and pressure roller. 5,486,908, Cl. 355-290.000.
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Harada, Naoki; Kayane, Yutaka; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Dioxazine blue dye compound having vinylsulfone type fiber reactive groups. 5,486,607, Cl. 544-76.000.
Miyasaka, Masayuka: *See*—
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Miyata, Hiroshi; Chiba, Yoshio; and Noguchi, Osami, to Mitsubishi Materials Corporation. Hard facing apparatus for applying hard facing to valves. 5,486,671, Cl. 219-76.140.
Miyazaki, Hajime: *See*—
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Miyazaki, Kyoichi: *See*—
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Miyazaki, Sho, to Sumitomo Wiring Systems, Ltd. Connector terminal. 5,486,123, Cl. 439-825.000.
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Mizukami, Shigeto: *See*—
Kawaguchi, Takayuki; Mizukami, Shigeto; Nozawa, Yasumitsu; and Nakao, Kouji, 5,487,044, Cl. 365-203.000.
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Mizutani, Hideki: *See*—
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Mizutani, Hidemasa: *See*—
Saika, Toshihiro; Mizutani, Hidemasa; Kaifu, Noriyuki; and Kameshima, Toshio, 5,486,738, Cl. 315-169.300.
Mnich, Jason G., to Rohr, Inc. Method for anodizing aluminum and product produced. 5,486,283, Cl. 205-174.000.
Moake, Gordon L.: *See*—
Schultz, Ward E.; and Moake, Gordon L., 5,486,695, Cl. 250-261.000.
Mobil Oil Corporation: *See*—
Abramo, Guy P.; Blain, David A.; and Cardis, Angeline B., 5,486,301, Cl. 252-51.50A.
Burns, Donald J.; and Nahmias, A. Michael, 5,486,390, Cl. 428-40.000.
Degnan, Thomas F.; Helton, Terry E.; and Lissy, Daria N., 5,486,284, Cl. 208-120.000.
McGee, Dennis E.; and Touhsaent, Robert E., 5,486,426, Cl. 428-516.000.
Peterson, Brian K.; and Jackson, Andrew, 5,485,895, Cl. 184-6.220.
Mochel, Virgil D.: *See*—
Stone, W. Ross; Palmer, Robert L.; Mochel, Virgil D.; and Karpinski, Robert P., 5,486,319, Cl. 264-406.000.
Moeller Products, Inc.: *See*—
Hitchcock, Robert S., 5,485,681, Cl. 33-722.000.
Mogi, Fumio, to Fuji Photo Film Co., Ltd. System for controlling the temperatures of processing solutions in photosensitive material processors. 5,486,890, Cl. 354-299.000.
Mohmand, Shakar Z. Decorative cards. 5,486,897, Cl. 355-132.000.
Moireau, Patrick: *See*—
Johnson, Timothy; and Moireau, Patrick, 5,486,416, Cl. 428-357.000.
Mokaya, Robert: *See*—
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Molex Incorporated: *See*—
Chang, Wei-Sun, 5,486,117, Cl. 439-357.000.
Colleran, Stephen A.; Pawlicki, Jeffrey J.; and Higgins, John O., Jr., 5,486,118, Cl. 439-374.000.
Molitor, Mark R.; and Robnett, James T., to Siemens Automotive Corporation. Lost motion actuator with damping transition. 5,485,813, Cl. 123-90.120.
Molnlycke AB: *See*—
Runeman, Bo; and Rönnberg, Peter, 5,486,168, Cl. 604-385.100.
Widlund, Urban; and Hansson, Roy, 5,486,273, Cl. 264-154.000.
Moltech Invent S.A.: *See*—
Manganiello, Fausto; Duruz, Jean-Jacques; and Bello, Vittorio, 5,486,278, Cl. 204-243.00R.
Momany, Frank A.: *See*—
Bowers, Cyril Y.; Cody, Wayne L.; Hubbs, John C.; Foster, Charles H.; and Momany, Frank A., 5,486,505, Cl. 514-16.000.
Monarch Marking Systems, Inc.: *See*—
Goodwin, Brent E.; Keller, Thomas P.; Makley, James A.; and Moore, Mark W., 5,486,259, Cl. 156-384.000.
Moncrief, Frank, to Riverwood International Corporation. Method and apparatus for inserting partitions into article groups. 5,485,713, Cl. 53-445.000.
Monn, James A., to Eli Lilly and Company. Intermediates for the synthesis of kainic acid. 5,486,620, Cl. 548-515.000.
Monnin, Raymond V.: *See*—
Grant, Larry J.; Monnin, Raymond V.; and Scott, James W., 5,486,401, Cl. 428-125.000.
Monsanto Company: *See*—
Griffith, Edward J.; and Ngo, Toan M., 5,486,232, Cl. 106-286.500.
Phillion, Dennis; Wong, Sai C.; and Shortt, Barry, 5,486,621, Cl. 549-4.000.
Monsson, Cai U.: *See*—
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.
Montalvo, Samuel A. Disk loader having a side air blast for proper bag presentation. 5,485,714, Cl. 53-459.000.
Montell North America Inc.: *See*—
Clementini, Luciano; Galambos, Adam F.; Lesca, Giuseppe; Spagnoli, Leonardo; Starsinic, Michael E.; and Ogale, Kumar, 5,486,419, Cl. 428-397.000.
Montoya, Jean P., to Michigan Critical Care Consultants, Inc. Peristaltic pump with occlusive inlet. 5,486,099, Cl. 417-477.130.
Moon, Kwang-ho: *See*—
Kim, Jong-kuk; and Moon, Kwang-ho, 5,486,931, Cl. 358-335.000.
Moon, Si Young, to Samsung Electronics Co., Ltd. Method and apparatus for covering and revealing the display of captions. 5,486,872, Cl. 348-564.000.
Mooney, David M.: *See*—
Amelina, Iam R.; Mooney, David M.; and Stoodley, Kevin A., 5,487,158, Cl. 395-375.000.
Moore, Mark W.: *See*—
Goodwin, Brent E.; Keller, Thomas P.; Makley, James A.; and Moore, Mark W., 5,486,259, Cl. 156-384.000.
Moore, Samuel R.: *See*—
Brydon, Louis B.; Moore, Samuel R.; and Lord, Peter W., 5,486,399, Cl. 428-99.000.
Moore, William E., II: *See*—
Leidig, Carl F.; Estelle, Lee R.; and Moore, William E., II, 5,486,895, Cl. 355-50.000.
Moran, Richard G.: *See*—
Eoga, Anthony B.; and Moran, Richard G., 5,486,304, Cl. 252-99.000.
Morano, Richard A.: *See*—
Carlotta, Michael; Dietl, Steven J.; and Morano, Richard A., 5,486,855, Cl. 347-87.000.
Morehouse, James H.; Furay, David M.; Volk, Steven B.; Utenick, Michael R.; Dunckley, James A.; Blagaila, John H.; Hopper, James F.; and Klein, Thomas A., to Integral Peripherals, Inc. Miniature disk drive with dynamic head loading with skewed lifting tab. 5,486,964, Cl. 360-105.000.
Morgan, Glenn D., to Neal, Charles M. Centrifuse extractor. 5,485,683, Cl. 34-58.000.
Morgan, Robert W., to Siemens Energy & Automation, Inc. Multi-neural electrical busway. 5,486,651, Cl. 174-68.200.
Morgan, Stuart K.: *See*—

Romm, Michael; Barker, Robert A.; and Morgan, Stuart K., 5,485,932, Cl. 211-87.000.

Morgen, Helmut: *See*—
Jobelius, Klaus-Dieter; Morgen, Helmut; Spurzem, Heinrich; and Völpel, Stefan, 5,485,987, Cl. 267-64.280.

Mori, Atsushi: *See*—
Ohishi, Yasutake; Kanamori, Terutoshi; Nishida, Yoshiki; Mori, Atsushi; and Sudo, Shoichi, 5,486,947, Cl. 359-341.000.
Sugimoto, Akinori; Mori, Atsushi; and Nanno, Kunio, 5,485,764, Cl. 74-535.000.

Mori, Hideko: *See*—
Takahashi, Masanori; Nagano, Tadashi; Mori, Hideko; and Kiyono, Masaki, 5,487,000, Cl. 364-419.080.

Mori, Kenji: *See*—
Yoshida, Takeshi; Amano, Hideaki; Kohno, Takashi; Mori, Kenji; Yoshida, Takashi; and Hirai, Hiromu, 5,486,965, Cl. 360-106.000.

Mori, Tetsuzo: *See*—
Tsuji, Toshihiko; Takeuchi, Seiji; Miyazaki, Kyoichi; Yoshii, Minoru; Nose, Noriyuki; and Mori, Tetsuzo, 5,486,919, Cl. 356-349.000.

Mori, Yukio; Kihara, Noriyasu; and Suzuki, Takamitu, to Nippondenso Co., Ltd. Hot-wire type airflow meter having a flow smoothing care. 5,485,746, Cl. 73-202.000.

Moriguchi, Haruhiko: *See*—
Miura, Yasushi; Moriguchi, Haruhiko; Murayama, Yasushi; and Tanaami, Hideyuki, 5,486,849, Cl. 347-18.000.

Moriguchi, Hiroyuki: *See*—
Fujii, Yozo; Moriguchi, Hiroyuki; Ikunami, Yoshikazu; Matsunawa, Masahiko; Tamura, Akihiko; Yasuda, Kazuo; Miwa, Tadashi; Horiuchi, Tatsumi; Kishimoto, Tadao; Fujimaki, Yoshihide; Takagiwa, Hiroyuki; and Tamura, Takashi, 5,486,898, Cl. 355-200.000.

Morihara, Kazushige: *See*—
Iimori, Akiro; and Morihara, Kazushige, 5,486,899, Cl. 355-203.000.

Morimoto, Kiyoshi: *See*—
Yuki, Koichiro; Hirai, Yoshihiko; Morimoto, Kiyoshi; Niwa, Masaaki; Yasui, Juro; Okada, Kenji; and Udagawa, Masaharu, 5,486,706, Cl. 257-25.000.

Morishita, Masakazu, to Canon Kabushiki Kaisha. Semiconductor device and electronic device by use of the semiconductor. 5,486,704, Cl. 257-9.000.

Morita, Akio: *See*—
Komori, Naoki; Morita, Akio; and Suzuki, Katsuaki, 5,487,148, Cl. 395-182.020.

Morita, Shizuo: *See*—
Fukuchi, Masakazu; Morita, Shizuo; Kayano, Shizuo; and Yoshino, Kunihisa, 5,486,901, Cl. 355-208.000.

Morita, Yoshitsugu, to Dow Corning Toray Silicone Company, Ltd. Epoxy-functional organopolysiloxane from SiH polysiloxane, unsaturated epoxy compound and alkene. 5,486,588, Cl. 528-15.000.

Morrison, Matthew M.: *See*—
Hildebrand, Bryan D.; Small, Laura C.; Yuan, Hansen A.; Barker, B. Thomas; Morrison, Matthew M.; Salehi, Abraham; and Smith, Forrest C., 5,486,176, Cl. 606-71.000.

Morrison, Robert C.: *See*—
Schwindeman, James A.; and Morrison, Robert C., 5,486,343, Cl. 423-413.000.

Morriss, Christopher E.: *See*—
Freedman, Robert; and Morriss, Christopher E., 5,486,762, Cl. 324-303.000.

Morrow, Julia A.: *See*—
Davis, William S., Jr.; and Morrow, Julia A., 5,486,094, Cl. 416-210.00R.

Morton International, Inc.: *See*—
Taylor, Robert D.; and Andros, Marc R., 5,486,248, Cl. 149-109.600.

Moser, Franklin G.: *See*—
Mangiardi, John R.; Moser, Franklin G.; Kantrowitz, Allen B.; Leibinger, Karl; and Leibinger, Franz, 5,486,179, Cl. 606-86.000.

Moser, Keith W.: *See*—
Bouman, David G.; Moser, Larry D.; and Moser, Keith W., 5,485,670, Cl. 29-732.000.

Moser, Larry D.: *See*—
Bouman, David G.; Moser, Larry D.; and Moser, Keith W., 5,485,670, Cl. 29-732.000.

Moser, Peter; Page, Campbell T.; and Püntener, Alois, to Ciba-Geigy Corporation. Process for the dyeing of leather with dye mixtures. 5,486,213, Cl. 8-437.000.

Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Stohs, Miriam; Colley, James D.; and Hargrove, Oliver W., Jr., to Electric Power Research Institute. Clear liquor scrubbing of sulfur dioxide with forced oxidation in flue gas desulfurization system. 5,486,342, Cl. 423-243.010.

Moss, Robert W., to Moss Sales & Service. Pneumatic applicator for agricultural particulates. 5,485,962, Cl. 239-655.000.

Moss Sales & Service: *See*—
Moss, Robert W., 5,485,962, Cl. 239-655.000.

Motorola: *See*—
Jachimowicz, Karen E.; Kelly, George R.; and Lebby, Michael S., 5,486,946, Cl. 359-263.000.
Shi, Song Q., 5,486,406, Cl. 428-209.000.

Motorola, Inc.: *See*—
Auyeung, Cheung; O'Connell, Kevin J.; and Levine, Stephen N., 5,486,863, Cl. 348-420.000.
Davenport, Roger A., 5,486,800, Cl. 333-193.000.
Girardeau, James W., Jr., 5,486,792, Cl. 331-10.000.
Girardeau, James W., Jr., 5,487,024, Cl. 364-753.000.
Jasper, Steven C.; and Birchler, Mark A., 5,487,091, Cl. 375-347.000.
Johnson, Scott V., 5,486,770, Cl. 324-754.000.
Kane, John R., 5,487,100, Cl. 379-57.000.
Kinerk, Keith E.; Quan, Hoang K.; and Magliocco, Joseph P., 5,486,824, Cl. 341-26.000.
Kuffner, Stephen L.; Carney, Scott N.; and Krenz, Eric L., 5,486,836, Cl. 343-700.0MS.
Nagode, Thomas D., 5,487,184, Cl. 455-126.000.
Otting, Marcia J.; and Kramer, John P., 5,486,843, Cl. 345-35.000.
Palandech, Robert L.; Bradley, Wayne H.; Opas, George F.; and Mitzlaff, James E., 5,486,789, Cl. 330-149.000.
Robb, Stephen; and Groenig, Paul, 5,486,718, Cl. 257-630.000.
Smolinske, Jeffrey C.; Tran, Phieu M.; Clanton, Christopher L.; and Scheibel, Robert C., Jr., 5,487,068, Cl. 370-94.100.
Sundaram, Lalgudi M. G., 5,486,481, Cl. 437-31.000.
Vraney, Lawrence E.; Protofanousis, Michael S.; Loew, Dean R.; and van Daal, Robert W., 5,487,169, Cl. 395-700.000.

Motoyama, Hideyuki: *See*—
Iwasa, Seiichi; Motoyama, Hideyuki; and Yoshioka, Makoto, 5,486,059, Cl. 400-488.000.

Motoyama, Tetsuro: *See*—
Tsay, Donny; and Motoyama, Tetsuro, 5,487,165, Cl. 395-600.000.

Muderlak, Kenneth: *See*—
Jacobsen, Chris J.; and Muderlak, Kenneth, 5,485,811, Cl. 119-798.000.

Mudry, Matthew; Aranyi, Ernie; and Nicholas, David A., to United States Surgical Corporation. Endoscopic surgical instrument. 5,486,189, Cl. 606-171.000.

Mueller, Dean W.: *See*—
Hammerstrom, Daniel W.; Mueller, Dean W.; and Owens, Stephen G., 5,487,153, Cl. 395-250.000.

Mueller, Richard A.: *See*—
Liang, Chi-Dean; McKearn, John P.; Farah, John M., Jr.; and Mueller, Richard A., 5,486,539, Cl. 514-521.000.

Mueller, Walter B., to W. R. Grace & Co.-Conn. Impact modified medical film. 5,486,387, Cl. 428-34.700.

Mujumdar, Ratnakar B.: *See*—
Waggoner, Alan S.; Ernst, Lauren A.; and Mujumdar, Ratnakar B., 5,486,616, Cl. 548-217.000.

Mukherjee, Anadi, to University of New Mexico. Principle and applications of multiphoton pumped upconverted lasers. 5,487,080, Cl. 372-69.000.

Mukherjee, Satyendranath: *See*—
Kim, Manjin J.; and Mukherjee, Satyendranath, 5,486,485, Cl. 437-41.000.

Mulder, Gerhardus J.; and Kuster, Frank, to Elektro-Thermit GmbH. Method for raising welded rail connections lying below the traveling surface on railroad tracks. 5,486,245, Cl. 148-582.000.

Muller, Karl-Heinz; and Oechsner, Hans, to SPECS Gesellschaft fur Oberflachenanalvtik and Computertechnologie mbH. Procedure and apparatus for the analysis of surface and/or depth profiles. 5,486,696, Cl. 250-288.000.

Müller, Karl-Heinz: *See*—
Rau, Gunnar; Müller, Karl-Heinz; and Schmid, Heinrich, 5,485,783, Cl. 101-378.000.

Müller, Michael: *See*—
Podszun, Wolfgang; and Müller, Michael, 5,486,548, Cl. 523-115.000.

Muller, Richard P.; and O'Hare, Richard J., to Circon Corporation. Rotatable endoscope sheath. 5,486,155, Cl. 600-137.000.

Mulvihill, Eileen R.; Yoshitake, Shinji; Ikeda, Yasunori; Suzuki, Suguru; Hashimoto, Akira; Yuzuriha, Teruaki; and Nexo, Bjorn A., to ZymoGenetics, Inc. Tissue plasminogen activator analogs having modified growth factor domains. 5,486,471, Cl. 435-226.000.

Mumme, Charles W.; and Gold, Philip, to Intermedics Orthopedics, Inc. Patella planer with adjustable stop. 5,486,177, Cl. 606-79.000.

Mummery, Herbert L., deceased (by Lois A. Mummery, executor); Koyamatsu, Anthony H.; and Young, Michael B., to United States of America, Navy. Cable recovery winder. 5,485,972, Cl. 242-386.000.

Mummery, Lois A., executor: *See*—
Mummery, Herbert L., deceased; Koyamatsu, Anthony H.; and Young, Michael B., 5,485,972, Cl. 242-386.000.

Muni, Indu A.: *See*—
Kitchell, Judith P.; Muni, Indu A.; and Boyer, Yvonne N., 5,486,362, Cl. 424-426.000.

Murakami, Eisaku: *See*—
Takenaka, Eiji; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Sugiyama, Toshihiro; Yamanaka, Tetsuo; Murakami, Eisaku; and Komatsubara, Satoru, 5,486,909, Cl. 355-259.000.

Murakami, Hidekuni: *See*—
Ushioda, Kohsaku; Yoshinaga, Naoki; Matsumura, Yoshikazu; Akisue, Osamu; Nishimura, Kunio; and Murakami, Hidekuni, 5,486,241, Cl. 148-330.000.

Murakami Kaimeido Co., Ltd.: *See*—
Nagao, Mitsuyoshi; Sato, Hidenori; and Hattori, Michiaki, 5,486,952, Cl. 359-603.000.

Murakami, Kanji: *See*—
Arike, Shigeharu; Iwasaki, Yorio; Shinada, Eiichi; Okamura, Toshiro; Murakami, Kanji; and Nakazato, Yuichi, 5,486,655, Cl. 174-259.000.

Murakami, Masaichi: *See*—
Hazama, Junji; Yanagihara, Masamitsu; Goto, Hideji; and Murakami, Masaichi, 5,486,896, Cl. 355-71.000.

Murakami, Shinichi: *See*—
Mizukuki, Tadahiko; Yabuuchi, Kouichi; Murakami, Shinichi; Sasakawa, Tomoyoshi; Shizuka, Kouhei; Kitagawa, Nobuhisa; and Hirose, Sumio, 5,486,396, Cl. 428-64.200.

Murakami, Tatsuo: *See*—
Takado, Kanemasa; and Murakami, Tatsuo, 5,486,365, Cl. 424-602.000.

Murakami, Toshio: *See*—
Shiokawa, Junji; Chiba, Hiroshi; Murakami, Toshio; Todaka, Yoshihiro; Ohsaka, Ichiro; and Azumi, Takashi, 5,486,860, Cl. 348-354.000.

Murakami, Yoshiteru; Iketani, Naoyasu; Takahashi, Akira; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Magneto-optical disk. 5,486,395, Cl. 428-64.300.

Murata Manufacturing Co., Ltd.: *See*—
Hamuro, Mitsuro; Matsuda, Shigeyoshi; and Kawabata, Shoichi, 5,486,377, Cl. 427-79.000.

Murata, Masahide; and Burkhardt, Terry J., to Exxon Chemical Patents Inc. Amidosilyldiyl bridged catalysts and method of polymerization using said catalysts.. 5,486,585, Cl. 526-130.000.

Murata, Shigemi: *See*—
Shimizu, Takeshi; Taruya, Masaaki; Murata, Shigemi; Koiwa, Mitsuru; and Maekawa, Toshio, 5,485,825, Cl. 123-634.000.

Murayama, Keijiro: *See*—
Suzuki, Seiichi; and Murayama, Keijiro, 5,485,711, Cl. 53-138.400.

Murayama, Masami: *See*—
Kakuma, Satoshi; Uriu, Shiro; Yoshimura, Shuji; Aso, Yasuhiro; and Murayama, Masami, 5,487,063, Cl. 370-56.000.

Murayama, Yasushi: *See*—
Miura, Yasushi; Moriguchi, Haruhiko; Murayama, Yasushi; and Tanaami, Hideyuki, 5,486,849, Cl. 347-18.000.

Murphy, Gary; and Matthias, Raymond, to Murphy Marketing, Inc. Wastewater straining device. 5,486,287, Cl. 210-164.000.

Murphy, Kevin T.: *See*—
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.

Murphy Marketing, Inc.: *See*—
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Murphy, Timothy P.: *See*—
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.

Murray, Terence C.: *See*—
Carangelo, Robert M.; Dettori, Mark D.; Grigely, Lawrence J.; Murray, Terence C.; Solomon, Peter R.; Van Dine, C. Peter; and Wright, David D., 5,486,917, Cl. 356-346.000.

Mutou, Shinichirou: *See*—
Douseki, Takakuni; Yamada, Junzo; Matsuya, Yasuyuki; and Mutou, Shinichirou, 5,486,774, Cl. 326-33.000.

Muylwyk, Robert K.: *See*—
Keizer, Daniel J.; Lax, Steven A.; and Muylwyk, Robert K., 5,486,725, Cl. 307-116.000.

Mycotech Corporation: *See*—
Bradley, Clifford A.; Kearns, Robert D.; Wood, Pauline P.; and Black, William E., 5,486,474, Cl. 435-262.000.

Myers, Gene; and Coury, William S. Method and apparatus for arteriotomy closure. 5,486,195, Cl. 606-213.000.

Nabae, Motohiro: *See*—
Hashiguchi, Koichi; Matsumoto, Yoshihiro; Imanaka, Makoto; Hira, Takaaki; Ikeda, Rinsei; Nishiyama, Naoki; Totsuka, Nobuo; Bekki, Yoichiro; and Nabae, Motohiro, 5,486,243, Cl. 148-552.000.

Nabeshima, Akira; Watanabe, Kaoru; and Saba, Toshikazu, to Sumitomo Wiring Systems, Ltd. Matable connector. 5,486,119, Cl. 439-489.000.

Nagai, Kazunobu, to Kabushiki Kaisha Toshiba. Inverter and air conditioner controlled by the same. 5,486,743, Cl. 318-439.000.

Nagano, Akihiko: *See*—
Suzuki, Kenji; Ishizaki, Akira; Ohtaka, Keiji; Suda, Yasuo; Fukahori, Hidehiko; Nagano, Akihiko; Konishi, Kazuki; and Tsunekawa, Tokuichi, 5,486,892, Cl. 354-402.000.

Nagano, Hideo: *See*—
Hatakenaka, Makoto; Sakurai, Haruo; and Nagano, Hideo, 5,487,097, Cl. 377-20.000.

Nagano, Tadashi: *See*—
Takahashi, Masanori; Nagano, Tadashi; Mori, Hideko; and Kiyono, Masaki, 5,487,000, Cl. 364-419.080.

Naganuma, Naohiro: *See*—
Masaki, Koichi; Fukuzawa, Yoshinao; Kitazawa, Kanji; Azuma, Takanobu; Naganuma, Naohiro; and Hosoda, Tetsuo, 5,486,731, Cl. 310-180.000.

Nagao, Mitsuyoshi; Sato, Hidenori; and Hattori, Michiaki, to Murakami Kaimeido Co., Ltd. Device for driving an EC antiglare mirror. 5,486,952, Cl. 359-603.000.

Nagasawa, Takeshi: *See*—
Kojima, Ryo; Sato, Yoshiro; and Nagasawa, Takeshi, 5,486,458, Cl. 435-14.000.

Nagashima, Shinya, to Ando Electric Co., Ltd. Optical wavelength meter with an up-down counter which measures the amounts of the overshoot and the back-shift of the moving mirror. 5,486,918, Cl. 356-346.000.

Nagata, Toshihiko; Sano, Hiroshi; Yamawaki, Takayuki; and Matsushita, Kunitake, to Minebea Co., Ltd. Bearing system in a motor for a floppy disk drive apparatus. 5,486,054, Cl. 384-610.000.

Naghshineh, Mahmoud: *See*—
Acampora, Anthony S.; and Naghshineh, Mahmoud, 5,487,065, Cl. 370-60.100.

Nagode, Thomas D., to Motorola, Inc. Offset transmission line coupler for radio frequency signal amplifiers. 5,487,184, Cl. 455-126.000.

Nahmias, A. Michael: *See*—
Burns, Donald J.; and Nahmias, A. Michael, 5,486,390, Cl. 428-40.000.

Naiki, Toshio: *See*—
Niikawa, Tetsuji; Nakamura, Hiromu; Naiki, Toshio; and Kohsaka, Jun, 5,486,954, Cl. 359-818.000.

Naito, Satoru: *See*—
Toda, Toshimasa; Naito, Satoru; Osawa, Hisayu; and Yamazaki, Takaaki, 5,486,556, Cl. 524-100.000.

Naitou, Akira: *See*—
Igarashi, Osamu; Naitou, Akira; Tougane, Hikohiro; Tsutsumi, Hironobu; and Kudou, Tosihisa, 5,486,803, Cl. 336-92.000.

Naka, Shigehisa; Khan, Tasadduq; Walder, André; Marty, Michel; Delaunay, Christophe; and Thevenin, Pierre, to Office National d'Etudes et de Recherches Aerospatiales. Niobium or tantalum based high specific strength inter metallic compounds and alloys. 5,486,242, Cl. 148-422.000.

Nakagawa, Katsumi; and Toyama, Noboru, to Canon Kabushiki Kaisha. Photovoltaic device. 5,486,238, Cl. 136-259.000.

Nakajima, Nobuo; and Imamura, Kenji, to NTT Mobile Communications Network Inc. Hand-off method and mobile station for spread spectrum mobile communication. 5,487,083, Cl. 375-200.000.

Nakajima, Shin; Fukushima, Michiyuki; and Hirao, Noriyoshi, to Hitachi Metals, Ltd. Nano-crystalline soft magnetic alloy ribbon with insulation coating and magnetic core made therefrom and pulse generator, laser unit and accelerator therewith. 5,486,404, Cl. 428-172.000.

Nakamura, Akihiro: *See*—
Nishihara, Akira; Nakamura, Akihiro; and Arakawa, Shigehiro, 5,486,420, Cl. 428-405.000.

Nakamura, Fumiharu, to Canon Kabushiki Kaisha. Ink jet recording apparatus for cleaning the recording head in accordance with the recording color. 5,486,850, Cl. 347-24.000.

Nakamura, Hiromu: *See*—
Niikawa, Tetsuji; Nakamura, Hiromu; Naiki, Toshio; and Kohsaka, Jun, 5,486,954, Cl. 359-818.000.

Nakamura, Norihiko: *See*—
Hirose, Katsuhiko; Tate, Takao; Nakamura, Norihiko; Sato, Takeshi; Iwahashi, Kazuhiro; Kamoshita, Shinji; and Yamanaka, Akihiro, 5,485,822, Cl. 123-501.000.

Nakamura, Shinichi; and Kubota, Takashi, to Mitsubishi Materials Corporation. Boring tool. 5,486,075, Cl. 408-230.000.

Nakamura, Shinobu: *See*—
Shimizume, Kazutoshi; and Nakamura, Shinobu, 5,486,827, Cl. 341-58.000.

Nakamura, Takashi: *See*—
Mine, Katsutoshi; Nakamura, Takashi; and Sasaki, Motoshi, 5,486,564, Cl. 524-588.000.

Nakanishi, H.: *See*—
Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; Kojima, Shin-ichi; Minney, Jack L.; Oishi, Motohiro; Fukumura, Keiji; and Nakanishi, H., 5,487,038, Cl. 365-191.000.

Nakano, Nobuyuki; and Yasui, Nobuhiko, to Matsushita Electric Industrial Co., Ltd. Vehicle recognition apparatus. 5,487,116, Cl. 382-104.000.

Nakano, Toshihiko: *See*—
Ichimori, Toshihide; Maeda, Akira; Funabashi, Motohisa; and Nakano, Toshihiko, 5,487,130, Cl. 395-3.000.

Nakao, Kouji: *See*—
Kawaguchi, Takayuki; Mizukami, Shigeto; Nozawa, Yasumitsu; and Nakao, Kouji, 5,487,044, Cl. 365-203.000.

Nakao, Naomi L.; and Wilk, Peter J., to Wilk & Nakao Medical Technology Inc. Polyp retrieval assembly with separable web member. 5,486,182, Cl. 606-114.000.

Nakashima, Yuzi: *See*—
Ota, Hitoshi; Yashiro, Masao; Yotsuya, Koki; Kako, Takuzo; and Nakashima, Yuzi, 5,486,338, Cl. 422-179.000.

Nakashita, Takefumi: *See*—
Kawasaki, Atsuko; Nakashita, Takefumi; Inui, Yoshiharu; and Shirouzu, Toshimichi, 5,486,194, Cl. 606-203.000.

Nakata, Kazushi: *See*—
Matsushita, Shigenori; Zhang, Shu H.; Yamamoto, Shigeru; Nishita, Satoru; and Nakata, Kazushi, 5,485,885, Cl. 172-7.000.

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Arike, Shigeharu; Iwasaki, Yorio; Shinada, Eiichi; Okamura, Toshiro; Murakami, Kanji; and Nakazato, Yuichi, 5,486,655, Cl. 174-259.000.

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Young, Paul R., 5,486,295, Cl. 210-701.000.

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Nantucket Industries, Inc.: *See—*
Samberg, Steve; and Berger, Barry, 5,485,919, Cl. 206-461.000.

Naramura, Syunpei: *See—*
Ohmory, Akio; Sano, Tomoyuki; Satoh, Masahiro; Naramura, Syunpei; Kobayashi, Satoru; and Sekiya, Yosuke, 5,486,418, Cl. 428-397.000.

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Sudo, Shigeru, 5,487,094, Cl. 376-100.000.

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Hsiue, Ging-Ho; Shy, Jow-Tsong; Liang, Jang-Jeng; and Chiang, Wen-Chang, 5,486,311, Cl. 252-299.660.
Huang, Yang-Tung, 5,486,934, Cl. 359-15.000.

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National Semiconductor Corporation: *See—*
Greiss, Israel; Cohen, Ronny; and Viner, Omri, 5,487,173, Cl. 395-800.000.
Nguyen, Hai T., 5,486,777, Cl. 326-68.000.
Young, Desmond W., 5,487,152, Cl. 395-200.010.

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Chim, Wai K.; Phang, Jacob C. H.; and Chan, Daniel S. H., 5,486,769, Cl. 324-751.000.

Navistar International Transportation Corp.: *See—*
Iwaszkiewicz, Titus, 5,485,820, Cl. 123-458.000.
McCandless, James C., 5,485,818, Cl. 123-294.000.

Nawa, Hiroshi: *See—*
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Nayyar, Dalip K.: *See—*
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NCR Corporation: *See—*
Ranf, Karl-Heinz; and Penrod, Jack R., 5,486,847, Cl. 345-173.000.

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Morgan, Glenn D., 5,485,683, Cl. 34-58.000.

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Edo, Yasuhiro, 5,487,042, Cl. 365-201.000.
Ide, Motoki, 5,487,090, Cl. 375-316.000.
Inoue, Tatsuro, 5,487,034, Cl. 365-185.180.
Kamiyama, Satoshi, 5,486,488, Cl. 437-60.000.
Kojima, Tatsuru; and Kohyama, Naoyuki, 5,486,656, Cl. 174-261.000.
Koyama, Kuniaki, 5,486,713, Cl. 257-310.000.
Kuriyama, Toshihide, 5,486,478, Cl. 436-52.000.
Ozawa, Kazunori, 5,487,128, Cl. 395-2.310.
Yoneyama, Yuzo, 5,487,176, Cl. 455-67.100.

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Nejdl, Benjamin J., to Safe-Lite, Inc. External cruise control warning light. 5,486,808, Cl. 340-464.000.

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Baker, Clark R., Jr., 5,485,847, Cl. 128-666.000.

Nelle, Günther, to Dr. Johannes Heidenhain GmbH. Encapsulated measuring apparatus. 5,485,680, Cl. 33-705.000.

Nellessen, Peter, Jr., to Benthos, Inc. Storage of cable. 5,485,973, Cl. 242-386.000.

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Lippmann, Raymond; Schnars, Michael J.; Nelson, James E.; Brouwer, Ivan R.; and Pachciarz, Mahlon R., 5,485,740, Cl. 73-1.00J.

Nelson, Randy. Spring biased braking device for in-line roller skates. 5,486,011, Cl. 280-11.200.

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Meur, Jean-Pierre, 5,486,973, Cl. 361-170.000.

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Boatman, Jack K.; Farnsworth, John T.; Johnson, Roger D.; and Young, Linda A., 5,486,049, Cl. 366-175.200.

Network Computing Devices, Inc.: *See—*
Providenza, John R.; and Boekelheide, Lee, 5,487,051, Cl. 365-233.000.

Newcor, Inc.: *See—*
Kettelson, Russell W.; and Spurr, Dion, 5,485,911, Cl. 198-791.000.

Newgarden, Joseph E., Jr. Robot table tennis ball server assembly. 5,485,995, Cl. 273-30.000.

Newsham, Mark D.; Earls, Jimmy D.; and Hefner, Robert E., Jr., to Dow Chemical Company, The. Mesogenic novolacs and resins. 5,486,580, Cl. 525-504.000.

Newton, John H. Self locking futon frame. 5,485,638, Cl. 5-37.100.

Newton, Michael E.; and Nunn, Michael D., to Mars Incorporated. Coin validators. 5,485,906, Cl. 194-203.000.

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Mulvihill, Eileen R.; Yoshitake, Shinji; Ikeda, Yasunori; Suzuki, Suguru; Hashimoto, Akira; Yuzuriha, Teruaki; and Nexo, Bjorn A., 5,486,471, Cl. 435-226.000.

Ng, Solomon K.: *See—*
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NGK Insulators, Ltd.: *See—*
Adachi, Masakazu; and Imao, Kouichi, 5,486,331, Cl. 264-344.000.
Takeya, Fuminori; and Suzuki, Tomio, 5,486,969, Cl. 360-127.000.

Ngo, Eric: *See—*
Sengupta, Louise; Ngo, Eric; Stowell, Steven; O'Day, Michelina; and Lancto, Robert, 5,486,491, Cl. 501-137.000.

Ngo, Toan M.: *See—*
Griffith, Edward J.; and Ngo, Toan M., 5,486,232, Cl. 106-286.500.

Nguyen, Hai T., to National Semiconductor Corporation. Low power differential receiver input circuit. 5,486,777, Cl. 326-68.000.

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Nguyen-Ba, Nghe: *See—*
Belleau, Bernard, deceased; and Nguyen-Ba, Nghe, 5,486,520, Cl. 514-274.000.

Niagara Mohawk Power Corporation: *See—*
Saylor, Charles H. M.; Cavo, Vincent N.; Riccardi, James A., Jr.; and Piszcz, Alan T., 5,487,139, Cl. 395-135.000.

Nicholas, David A.: *See—*
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Niday, Evelyn: *See—*
Gordon, Julian; Hawkes, Richard; Niday, Evelyn; and Towbin, Harry, 5,486,452, Cl. 435-5.000.

Nielsen, Per H.: *See—*
Toon, Donald A.; Nielsen, Per H.; and Skov, Bent, 5,485,881, Cl. 166-165.000.

Nielsen, Per M., to Novo Nordisk A/S. Casein hydrolyzate and method for production of such casein hydrolyzate. 5,486,461, Cl. 435-68.100.

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Ohtsuki, Shigeru, 5,485,645, Cl. 15-103.000.

Nihon Kohden Corporation: *See—*
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Niikawa, Tetsuji; Nakamura, Hiromu; Naiki, Toshio; and Kohsaka, Jun, to Minolta Co., Ltd. Optical device having an optical lens and a mounting assembly. 5,486,954, Cl. 359-818.000.

Niitsuma, Tetsuya: *See—*
Koizumi, Noboru; Haneda, Satoshi; Ichihara, Yoshiyuki; Hasebe, Takashi; and Niitsuma, Tetsuya, 5,486,927, Cl. 358-298.000.

Nikko Kogyo Kabushiki Kaisha: *See—*
Igarashi, Osamu; Naitou, Akira; Tougane, Hikohiro; Tsutsumi, Hironobu; and Kudou, Tosihisa, 5,486,803, Cl. 336-92.000.

Nikon Corporation: *See—*
Hazama, Junji; Yanagihara, Masamitsu; Goto, Hideji; and Murakami, Masaichi, 5,486,896, Cl. 355-71.000.
Ishida, Tomohisa, 5,486,711, Cl. 257-258.000.
Saito, Jun; and Kurita, Shinichi, 5,487,059, Cl. 369-116.000.
Takagi, Tadao, 5,486,893, Cl. 354-410.000.

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Nilsson, Bengt, to Chemrec Aktiebolag. Gasification of carbonaceous material in a reactor having a gasification zone and a combustion zone. 5,486,269, Cl. 162-31.000.

Nilz, Gerhard: *See—*
Hagen, Helmut; Nilz, Gerhard; Walter, Helmut; and Landes, Andreas, 5,486,618, Cl. 548-362.100.

Niopic Moscow Research and Production Association: *See—*
Buchecker, Richard; Chernova, Nina I.; Ivaschenko, Alexander V.; Loseva, Marina V.; Petrashevich, Olga S.; Pozhidaev, Evgeniy P.; Rabinovich, Arnold Z.; and Schadt, Martin, 5,486,310, Cl. 252-299.610.

Nippon Hoso Kyokai: *See—*
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Nippon Petrochemicals Company, Limited: *See—*
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Nippon Sheet Glass Co., Ltd.: *See—*
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Nippon Steel Corporation: *See*—
Habu, Ryuichi, 5,485,803, Cl. 117-14.000.
Ota, Hitoshi; Yashiro, Masao; Yotsuya, Koki; Kako, Takuzo; and Nakashima, Yuzi, 5,486,338, Cl. 422-179.000.
Ushioda, Kohsaku; Yoshinaga, Naoki; Matsumura, Yoshikazu; Akisue, Osamu; Nishimura, Kunio; and Murakami, Hidekuni, 5,486,241, Cl. 148-330.000.
Nippon Tansan Gas Company Limited: *See*—
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Nippon Telegraph and Telephone Corporation: *See*—
Douseki, Takakuni; Yamada, Junzo; Matsuya, Yasuyuki; and Mutou, Shinichirou, 5,486,774, Cl. 326-33.000.
Nishimura, Kazutoshi; Sakamoto, Hideki; and Suzuki, Hideharu, 5,487,035, Cl. 365-189.020.
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Sasayama, Koji; and Habara, Keishi, 5,486,943, Cl. 359-123.000.
Nippondenso Co., Ltd.: *See*—
Ina, Katsuhiro, 5,486,817, Cl. 340-825.160.
Mori, Yukio; Kihara, Noriyasu; and Suzuki, Takamitu, 5,485,746, Cl. 73-202.000.
Nishi, Masaya: *See*—
Shibata, Kenichiro; Hatta, Toshiyuki; Matsuyama, Fumio; Miyamoto, Masahiro; Okui, Manabu; and Nishi, Masaya, 5,485,950, Cl. 228-194.000.
Nishida, Yoko: *See*—
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Nishida, Yoshiki: *See*—
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Nishihara, Akira; Nakamura, Akihiro; and Arakawa, Shigehiro, to Mitsubishi Materials Corporation. Hydrophobic silica powder, manufacturing method thereof and developer for electrophotography. 5,486,420, Cl. 428-405.000.
Nishimura, Kazutoshi; Sakamoto, Hideki; and Suzuki, Hideharu, to Nippon Telegraph and Telephone Corporation. Method of multiplexed data reading/writing suitable for video-on-demand system. 5,487,035, Cl. 365-189.020.
Nishimura, Kunio: *See*—
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Nishita, Satoru: *See*—
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Nishiyama, Naoki: *See*—
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Niwa, Hitoshi: *See*—
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Niwa, Masaaki: *See*—
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Nobilec, Leslaw. Clamping means for ski, or the like. 5,485,988, Cl. 269-21.000.
Noda, Hirotoshi, to Kabushiki Kaisha Yamazaki Haguruma Seisakusho. Cutting machine for railroad rail. 5,486,136, Cl. 451-347.000.
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Dragoo, Jerry L.; Bogdanski, Michael S.; Ahr, Nicholas A.; and Noel, John R., 5,486,167, Cl. 604-384.000.
Noell, John L. W.; Gaggar, Satish; McCarty, George P.; and Miller, Kenneth, to General Electric Co. High rubber backing multi-layer ABS system which exhibits improved chemical resistance to HCFC blowing agents. 5,486,407, Cl. 428-215.000.
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Noguchi, Osami: *See*—
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Nohara, Kazuya; and Taniguchi, Naohiro, to Matsushita Electric Works, Ltd. Acceleration detector. 5,485,749, Cl. 73-517.340.
Nohmi Bosai Ltd.: *See*—
Ariga, Yasuo; and Hirooka, Eiji, 5,486,816, Cl. 340-630.000.
Nokia Mobile Phones Ltd.: *See*—
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Hänninen, Jouni, 5,487,178, Cl. 455-67.400.
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Nomadic Structures, Inc.: *See*—
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Nordahl, Willy. Construction assembly including a rectangular block for dry walling or the permanent construction of a wall or partition. 5,485,703, Cl. 52-562.000.
Nordhauser, Mary Ann: *See*—
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Nordica S.p.A.: *See*—
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Nordstrand, Ingrid V.; and Bodin, Stig R., to Telefonaktiebolaget LM Ericsson. Radio link failure. 5,487,071, Cl. 370-110.100.
Norfleet, James; Carter, Willie J.; Frankel, Matthew J.; and Gaffar, Abdul, to Colgate Palmolive Company. Desensitizing anti-tartar dentifrice. 5,486,350, Cl. 424-49.000.
North American Philips Corporation: *See*—
Chen, Teh-Yi J., 5,486,480, Cl. 437-29.000.
North Carolina State University: *See*—
Comins, Daniel L., 5,486,615, Cl. 546-301.000.
Northey, William A.; and Koser, James R., to Berg Technologies, Inc. Connector assembly. 5,486,115, Cl. 439-108.000.
Northrop Grumman Corporation: *See*—
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Norton, Adam E.; and Pham, Hung V., to Prometrix Corporation. Method and apparatus for measuring reflectance in two wavelength bands to enable determination of thin film thickness. 5,486,701, Cl. 250-372.000.
Norton, William E.: *See*—
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Nowotarski, Mark S.; Lemen, Don J.; Snyder, William J.; and Leturno, David B., to Praxair Technology, Inc. Laminar flow shielding of fluid jet. 5,486,383, Cl. 427-446.000.
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Nozawa, Yusaku; Ohtsu, Wataru; Ichiki, Nobuhiko; Ino, Kazuyuki; Matsuzaki, Hiroshi; and Takahashi, Kinya, to Hitachi Construction Machinery Co., Ltd. Hydraulic drive system. 5,485,724, Cl. 60-421.000.
NTT Mobile Communications Network Inc.: *See*—
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Nudelman, Raphael: *See*—
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Nutting, Harold E., to Boeing Company, The. Cargo handling system rollout stop assembly. 5,486,077, Cl. 410-69.000.
O. K. Wack Chemie GmbH: *See*—
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Obshestvo S Organichennoi Otvetstvennostju "Nauchino-Proizvodstvennaya Firma Spettsstroyservis" : *See*—
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Ocean Arks International, Inc.: *See*—
Todd, John H.; and Shaw, James M., 5,486,291, Cl. 210-602.000.
Ochiai, Kuniaki; and Komakine, Shigeo, to Kabushiki Kaisha Tec. Method of fabricating an ink jet print head. 5,485,663, Cl. 29-25.350.
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Oechsner, Hans: *See*—
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Oestreich, Ulrich; Dotzer, Peter; and Unterberger, Siegfried, to Siemens Aktiengesellschaft. Method and apparatus for manufacturing an optical ribbon conductor. 5,486,378, Cl. 427-163.200.

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Naka, Shigehisa; Khan, Tasadduq; Walder, André; Marty, Michel; Delaunay, Christophe; and Thevenin, Pierre, 5,486,242, Cl. 148-422.000.

Ogale, Kumar: *See*—
Clementini, Luciano; Galambos, Adam F.; Lesca, Giuseppe; Spagnoli, Leonardo; Starninic, Michael E.; and Ogale, Kumar, 5,486,419, Cl. 428-397.000.

Ogasawara, Masato: *See*—
Tsuneeda, Kenichi; Yoshida, Sachiko; and Ogasawara, Masato, 5,486,906, Cl. 355-219.000.

Ogawa, Hisahito: *See*—
Takimoto, Akio; Wakemoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, 5,486,442, Cl. 430-78.000.

Ogawa, Tadayoshi: *See*—
Sano, Masashi; and Ogawa, Tadayoshi, 5,486,925, Cl. 356-373.000.

Ogawa, Yasuaki: *See*—
Uda, Yoshiaki; Nishida, Yoko; and Ogawa, Yasuaki, 5,486,508, Cl. 514-58.000.

Ogawa, Yasushige: *See*—
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Silberklang, Alex; and Ohana, Israel, 5,486,700, Cl. 250-363.040.

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Knowlton, Christopher M.; O'Hara, Robert J.; and Strickland, Timothy A., 5,485,653, Cl. 15-340.400.

O'Hare, Richard J.: *See*—
Muller, Richard P.; and O'Hare, Richard J., 5,486,155, Cl. 600-137.000.

Ohashi, Hiroshi: *See*—
Tanaka, Yoichiro; Tanimoto, Kazushi; Ohashi, Hiroshi; Hikosaka, Takashi; Ohtsubo, Yasuo; and Hoshina, Shigeru, 5,486,967, Cl. 360-113.000.

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Ohhashi, Shuzo: *See*—
Takenouchi, Tomoo; Ichinomiya, Yoshiaki; Ishizaka, Junji; Itagaki, Junji; Ohhashi, Shuzo; Azuma, Tsukasa; and Tanaka, Yasuhiko, 5,487,082, Cl. 373-42.000.

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Ohkita, Masakazu: *See*—
Kishimoto, Yoshihisa; Hiraishi, Nobushige; Takahashi, Wataru; Ohkita, Masakazu; Ishigaki, Naoyuki; and Matsuura, Yutaka, 5,486,224, Cl. 75-254.000.

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Misaizu, Kouei; Honda, Shoichiro; and Ohnishi, Hiroshi, 5,487,089, Cl. 375-296.000.

Ohno, Kyoko: *See*—
Kudo, Masaki; and Ohno, Kyoko, 5,486,644, Cl. 811-604.000.

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Shiokawa, Junji; Chiba, Hiroshi; Murakami, Toshio; Todaka, Yoshihiro; Ohsaka, Ichiro; and Azumi, Takashi, 5,486,860, Cl. 348-354.000.

Ohta, Kenji: *See*—
Murakami, Yoshiteru; Iketani, Naoyasu; Takahashi, Akira; and Ohta, Kenji, 5,486,395, Cl. 428-64.300.

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Yamamoto, Hiroshi; Takeyasu, Nobuyuki; and Ohta, Tomohiro, 5,486,492, Cl. 437-192.000.

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Ohtake, Koji, to Fujitsu Limited. Method of determining initial transmission power. 5,487,180, Cl. 455-54.100.

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Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; Kojima, Shin-ichi; Minney, Jack L.; Oishi, Motohiro; Fukumura, Keiji; and Nakanishi, H., 5,487,038, Cl. 365-191.000.

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Yuki, Koichiro; Hirai, Yoshihiko; Morimoto, Kiyoshi; Niwa, Masaaki; Yasui, Juro; Okada, Kenji; and Udagawa, Masaharu, 5,486,706, Cl. 257-25.000.

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Okawa, Tadashi, to Dow Corning Toray Silicone Co., Ltd. Method for preparing diorganopolysiloxane having a functional group at only one end of the molecular chain. 5,486,635, Cl. 556-437.000.

Oki Electric Industry Co., Ltd.: *See*—
Komazaki, Tomokazu; Gunji, Katsuhiko; Noguchi, Kazushige; and Tanoie, Kunihiro, 5,486,799, Cl. 333-134.000.

Okuda, Mitsuhiro: *See*—
Hamura, Masayuki; Okuda, Mitsuhiro; and Makihata, Yuuki, 5,486,679, Cl. 219-130.500.

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Shibata, Kenichiro; Hatta, Toshiyuki; Matsuyama, Fumio; Miyamoto, Masahiro; Okui, Manabu; and Nishi, Masaya, 5,485,950, Cl. 228-194.000.

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O'Lenick, Anthony J., Jr.: *See*—
Mitchnick, Mark; and O'Lenick, Anthony J., Jr., 5,486,631, Cl. 556-10.000.

Olin Corporation: *See*—
Caron, Ronald N.; and Breedis, John F., 5,486,244, Cl. 148-554.000.
Schmidt, Eckart W.; and Gavin, David F., 5,485,722, Cl. 60-219.000.

Oliver Design, Inc.: *See*—
Jones, Oliver D.; and Stephens, Donald E., 5,486,134, Cl. 451-209.000.

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Olson, Gene E.; and Wridt, Gerald A., to Snap-on Incorporated. Square drive adapter. 5,485,769, Cl. 81-177.850.

Olson, Todd; Meiser, Dan; Steed, Gary; Huffman, Eric; Otten, Matthew; VanOverloop, Ronald; Powell, Darrel; Knodell, Thomas; Rhad, Edward; Chen, Ralph; and Cook, Robert, to Ethicon, Inc. Linear stapling mechanism with cutting means. 5,485,947, Cl. 227-176.100.

Olszewski, Walter K.: *See*—
Rademaker, Robert A.; Goiffon, John J.; Connell, Michael L.; and Olszewski, Walter K., 5,485,745, Cl. 73-151.000.

Olympus Optical Co., Ltd.: *See*—
Mihara, Takashi; Watanabe, Hitoshi; Yoshimori, Hiroyuki; Paz de Araujo, Carlos A.; and McMillan, Larry D., 5,487,032, Cl. 365-145.000.

Omiya, Akio, to Fuji Photo Optical Co., Ltd. Photographic camera with strobe. 5,486,887, Cl. 354-149.110.

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Kawashima, Mitsunobu; and Omura, Ikuo, 5,486,544, Cl. 522-17.000.

Omura, Takashi: *See*—
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Harada, Naoki; Kayane, Yutaka; and Omura, Takashi, 5,486,607, Cl. 544-76.000.

On-Line Technologies Inc: *See*—

Carangelo, Robert M.; Dettori, Mark D.; Grigely, Lawrence J.; Murray, Terence C.; Solomon, Peter R.; Van Dine, C. Peter; and Wright, David D., 5,486,917, Cl. 356-346.000.

Ona, Isao: *See*—
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Koenig, David J., 5,486,751, Cl. 322-86.000.

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Yamaguchi, Yukuo; Onuki, Kazuhiko; and Sugiyama, Kazuhide, 5,486,882, Cl. 353-77.000.

Onuki, Masatsugu: *See*—
Kikuchi, Nobuyuki; Ookochi, Katsuaki; Onuki, Masatsugu; and Yarimizu, Kazuaki, 5,486,261, Cl. 156-422.000.

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Opas, George F.: *See*—
Palandech, Robert L.; Bradley, Wayne H.; Opas, George F.; and Mitzlaff, James E., 5,486,789, Cl. 330-149.000.

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Fergason, James L.; Berman, Arthur L.; and Jacobs, Stephen D., 5,486,940, Cl. 359-74.000.

Optotechno Co., Ltd.: *See*—
Hayashi, Yutaka; Sato, Masaaki; and Maeyashiki, Yoshiki, 5,486,709, Cl. 257-110.000.

Organek, Gregory J.; Preston, David M.; and Janson, David A., to Eaton Corporation. Clutch ball ramp actuator with drive and coast apply. 5,485,904, Cl. 192-35.000.

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Yagyu, Tatsuya; and Ono, Takashi, 5,486,601, Cl. 534-666.000.

Orth, Jeffrey L.: *See*—
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Ortho Diagnostic Systems, Inc.: *See*—
Madonna, M. Jane; and Woods, Derek, 5,486,454, Cl. 435-6.000.

Osanai, Jun: *See*—
Saito, Yutaka; Osanai, Jun; Kojima, Yoshikazu; and Kamiya, Masaaki, 5,486,716, Cl. 257-360.000.

Osawa, Hisayu: *See*—
Toda, Toshimasa; Naito, Satoru; Osawa, Hisayu; and Yamazaki, Takaaki, 5,486,556, Cl. 524-100.000.

Osborn, James W.: *See*—
Capeci, Scott W.; Osborn, James W.; Angell, Adrian J. W.; and van Dijk, Paul, 5,486,303, Cl. 252-89.100.

Osborne, Robert, to Phillips Cables Limited. Textile braids for cables, flexible tubes and the like. 5,485,774, Cl. 87-6.000.

Oshgan, Thomas J., to Eaton Corporation. Detented paddle blade switch assembly. 5,486,669, Cl. 200-556.000.

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Caplan, Arnold I.; and Haynesworth, Stephen E., 5,486,359, Cl. 424-93.700.

Osram Sylvania Inc.: *See*—
Hrubowchak, David M.; and Brates, Nanu, 5,486,737, Cl. 313-634.000.

Ostry, Diethelm I.: *See*—
O'Sullivan, John D.; Daniels, Graham R.; Percival, Terence M. P.; Ostry, Diethelm I.; and Deane, John F., 5,487,069, Cl. 370-94.300.

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Kowalczyk, Thomas M.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kulak, Richard E.; and Barrett, David W., 5,485,896, Cl. 187-330.000.

Otruba, Svatoboj, to B&H Manufacturing Company. Method of labeling containers. 5,486,253, Cl. 156-215.000.

Otten, Matthew: *See*—
Olson, Todd; Meiser, Dan; Steed, Gary; Huffman, Eric; Otten, Matthew; VanOverloop, Ronald; Powell, Darrel; Knodell, Thomas; Rhad, Edward; Chen, Ralph; and Cook, Robert, 5,485,947, Cl. 227-176.100.

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Ouchi, Norman K.: *See*—
Hassner, Martin A.; Lang, Luke C. K.; Ouchi, Norman K.; and Schwiegelshohn, Uwe, 5,487,077, Cl. 371-40.100.

Oud, Anna E. M.: *See*—
De Jong, Krijn P.; Lednor, Peter W.; Oud, Anna E. M.; Schoonebeek, Ronald J.; Vonkeman, Koert A.; and Van Der Zwet, Gerardus P., 5,486,313, Cl. 252-373.000.

Ouellette, Gerry: *See*—
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Ouye, Michael M.: *See*—
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.

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Grant, Larry J.; Monnin, Raymond V.; and Scott, James W., 5,486,401, Cl. 428-125.000.

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Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Stohs, Miriam; Colley, James D.; and Hargrove, Oliver W., Jr., 5,486,342, Cl. 423-243.010.

Owens, Stephen G.: *See*—
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Arai, Masatoshi; Inoue, Yoshifumi; and Ozai, Toshiyuki, 5,486,567, Cl. 524-863.000.

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Asahara, Norimi; Fukumura, Kagenori; Hojo, Yasuo; and Ozaki, Kazuhisa, 5,486,146, Cl. 477-65.000.

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Kimura, Kazuya; Ito, Masafumi; Mizutani, Hideki; Makino, Yoshihiro; Hirota, Suguru; Ozeki, Taro; Kato, Keiichi; and Kayukawa, Hiroaki, 5,486,098, Cl. 417-222.200.

P.I., Inc.: *See*—
Avery, John R., 5,486,206, Cl. 607-104.000.

Pacesetter, Inc.: *See*—
Canfield, Lyle D., 5,486,201, Cl. 607-13.000.

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Lippmann, Raymond; Schnars, Michael J.; Nelson, James E.; Brouwer, Ivan R.; and Pachciarz, Mahlon R., 5,485,740, Cl. 73-1.00J.

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Yang, Chang M.; Hong, Jong Y.; Lee, Ki W.; Lee, Byeong G.; and Chang, Dong I., 5,486,624, Cl. 549-418.000.

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Palmer, Robert L.: *See*—
Stone, W. Ross; Palmer, Robert L.; Mochel, Virgil D.; and Karpinski, Robert P., 5,486,319, Cl. 264-406.000.

Pan, Yuh-Guo: *See*—
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Wenke, Gottfried; Pan, Yuh-Guo; Lim, Mu-Ill; and Stasaitis, Linas, 5,486,619, Cl. 548-508.000.

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Panzone, Gianbattista: *See*—
Giantonio, Anacleto; and Panzone, Gianbattista, 5,486,465, Cl. 435-70.100.

Papp, George W. Exterior windshield surface blower. 5,486,139, Cl. 454-123.000.

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Pardijs, Hendrik J.: *See*—
Bernardus, Wilhelmus A.; and Pardijs, Hendrik J., 5,486,145, Cl. 452-58.000.

Park, Chin S.; Holler, Mark A.; Diamond, Jay M.; The, Siang-Chun; Santoni, Umberto; and Buckmann, Kenneth R., to Intel Corporation. Distance calculating neural network classifier chip and system. 5,487,133, Cl. 395-27.000.

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Choi, Jeong D.; Cheon, In K.; Song, Geun H.; and Park, Hee Y., 5,486,958, Cl. 360-85.000.
Park, Hee-Choul: *See*—
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Partovi, Hamid; and Draper, Donald A., to Intergraph Corporation. Carry chain adder using regenerative push-pull differential logic. 5,487,025, Cl. 364-788.000.
Pasricha, Pankaj J.; and Kalloo, Anthony N., to John Hopkins University. Winged biliary stent. 5,486,191, Cl. 606-191.000.
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Patko, Joseph M., to AlliedSignal Inc. Spacer member for aircraft brakes. 5,485,898, Cl. 188-71.500.
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Paulat, Martin J., Jr.: *See*—
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Pavlat, Jeffrey W.: *See*—
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Payeur, Daniel R. Vacuum cleaning and shampooing system having high-pressure air means. 5,485,651, Cl. 15-321.000.
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Pearson, Ronald W.; Deierling, Kevin E.; and Williams, Clark R., to Dallas Semiconductor Corporation. Integrated circuit with real time, elapsed time, and cycle counter clocks. 5,487,096, Cl. 377-15.000.
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Taylor, Patrick R.; and Pirzada, Shahid A., 5,486,675, Cl. 217-121.590.

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Akerberg, Denis W., 5,486,557, Cl. 524-111.000.

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Mavridis, Harilos; and Shroff, Ramesh N., 5,486,333, Cl. 264-541.000.
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Rademaker, Robert A.; Goiffon, John J.; Connell, Michael L.; and Olszewski, Walter K., to Halliburton Company. Modular downhole inspection system for coiled tubing. 5,485,745, Cl. 73-151.000.

Rader, H. John, III. Lightweight overrunning clutch assembly. 5,485,905, Cl. 192-64.000.

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Radius Inc: *See—*
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RCA Thomson Licensing Corporation: *See—*
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Flint, W. Toriran; and Byers, Joseph L., 5,486,402, Cl. 428-141.000.
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Hirata, Masumi; Funakoshi, Wataru; and Sasaki, Katsushi, 5,486,555, Cl. 524-83.000.
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Sato, Kazuma: *See*—
Kashizaki, Yoshio; Miyazaki, Hajime; Suzuki, Koichi; Go, Shintetsu; and Sato, Kazuma, 5,486,440, Cl. 430-62.000.
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Fujita, Shigehisa; and Sato, Kenji, 5,487,021, Cl. 364-578.000.
Sato, Kozo: *See*—
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Sato, Shigehiro: *See*—
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Sawamura, Masashi: *See*—
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Sawicki, George C.: *See*—
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Sawyer, J. Scott, to Eli Lilly and Company. N-benzyl dihydroindole LTD_4 antagonists. 5,486,612, Cl. 546-176.000.
Saylor, Charles H. M.; Cavo, Vincent N.; Riccardi, James A., Jr.; and Piszcz, Alan T., to Niagara Mohawk Power Corporation. Method and system for generating a raster display having expandable graphic representations. 5,487,139, Cl. 395-135.000.
Sbalchiero, Federico; and Rossi, Alessandro, to Axis USA, Inc. Methods and apparatus for commutator fusing. 5,486,672, Cl. 219-86.410.
Scarpa, Carl G., to Hitachi America, Ltd. Automatic frequency control using split-band signal strength measurements. 5,487,186, Cl. 455-192.200.
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Buchecker, Richard; Chernova, Nina I.; Ivaschenko, Alexander V.; Loseva, Marina V.; Petrashevich, Olga S.; Pozhidaev, Evgeniy P.; Rabinovich, Arnold Z.; and Schadt, Martin, 5,486,310, Cl. 252-299.610.
Schäfer, Dietmar: *See*—
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Scharpf, Eric W.: *See*—
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Scheibel, Robert C., Jr.: *See*—
Smolinske, Jeffrey C.; Tran, Phieu M.; Clanton, Christopher L.; and Scheibel, Robert C., Jr., 5,487,068, Cl. 370-94.100.
Schenck, Robert R. Anastomosis device and method. 5,486,187, Cl. 606-153.000.
Schering Corporation: *See*—
Leong, William; and Smith, Lyman H., 5,486,625, Cl. 549-448.000.
Schick, Steven F.: *See*—
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Schiel, Christian, to J.M. Voith GmbH. Angularly adjustable drainage foil for paper machines. 5,486,270, Cl. 162-352.000.
Schilling, Gerhard: *See*—
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Schlageter, Karl M.; and Ng, Solomon K., to SGS-Thomson Microelectronics, Inc. Chopper stabilized operational transconductance amplifier. 5,486,788, Cl. 330-9.000.
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Freedman, Robert; and Morriss, Christopher E., 5,486,762, Cl. 324-303.000.
Sezginer, Abdurrahman, 5,486,761, Cl. 324-303.000.
Taherian, M. Reza; and Habashy, Tarek M., 5,485,743, Cl. 73-61.440.
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Schmidt, Eckart W.; and Gavin, David F., to Olin Corporation. Catalytic decomposition of hydroxylammonium nitrate-based monopropellants. 5,485,722, Cl. 60-219.000.
Schmidt, Erwin: *See*—
Hannewischmidt, Albert; Kühn, Eberhard; and Schmidt, Erwin, 5,486,447, Cl. 430-197.000.
Schmidt, Éva: *See*—
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Schmidt, Günther; Randel, Peter; Engels, Hans-Werner; and Orlich, Bernd, to Huls Troisdorf AG. Furnace with in situ foamed insulation and process for its manufacture. 5,485,986, Cl. 266-280.000.
Schmidt, Rudolf, to Carolina Christ Abgasfreie Werkzeugreinigungsapparate für die Kunststoffindustrie. Method of and apparatus for cleaning objects of plastics processing machines. 5,485,858, Cl. 134-107.000.
Schnars, Michael J.: *See*—
Lippmann, Raymond; Schnars, Michael J.; Nelson, James E.; Brouwer, Jean R.; and Pachciarz, Mahlon R., 5,485,740, Cl. 73-1.000.
Schneider, Georg; and Rötthlein, Ewald, to Koenig & Bauer Aktiengesellschaft. Process and device for adjusting the contact pressure of a synthetic-blanket roller in rotary printing presses. 5,485,785, Cl. 101-487.000.
Schneider, Reiner: *See*—
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Schnell, Klaus: *See*—
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Schneuing, Ralf: *See*—
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Schnoes, Heinrich K.: *See*—
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Schoen, Joel A.: *See*—
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Schoenbuchner, Hans W.: *See*—
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Schoenek, Victor G.: *See*—
Faitel, William M.; and Schoenek, Victor G., 5,485,912, Cl. 198-803.010.
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Schöning, Michael: *See*—
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De Jong, Krijn P.; Lednor, Peter W.; Oud, Anna E. M.; Schoonebeek, Ronald J.; Vonkeman, Koert A.; and Van Der Zwet, Gerardus P., 5,486,313, Cl. 252-373.000.
Schrempf, Christoph: *See*—
Kalt, Wolfram; Männer, Johann; Eichinger, Dieter; and Schrempf, Christoph, 5,486,230, Cl. 106-165.000.
Schrenk, Walter J.; Wheatley, John A.; and Chang, Victor S., to Dow Chemical Company, The. Birefringent interference polarizer. 5,486,949, Cl. 359-498.000.
Schrepfer, M. W., to UOP. Drum for particulate handling with fines collector. 5,485,923, Cl. 209-235.000.
Schubert, Priscilla: *See*—
Dalla Betta, Ralph A.; Reed, Daniel L.; and Schubert, Priscilla, 5,486,336, Cl. 422-90.000.
Schulte, Eugene L. Soap grip for bathing. 5,486,064, Cl. 401-201.000.
Schultz, Merle A.: *See*—
Popescu, Valeri; Schultz, Merle A.; Gibson, Gary A.; Spracklen, John E.; and Lightner, Bruce D., 5,487,156, Cl. 395-375.000.
Schultz, Ward E.; and Moake, Gordon L., to Halliburton Company. Standoff compensation for nuclear logging while drilling systems. 5,486,695, Cl. 250-261.000.
Schulz, Richard H.: *See*—
Laabs, Timothy P.; Misner, Michael O.; Schulz, Richard H.; and Spencer, Elbert M., 5,485,735, Cl. 70-358.000.
Schupp, Eberhard: *See*—
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Schwabe, Robert J.; Eggleston, Michael R.; and Coffin, Louis F., Jr., to General Electric Company. Method and system for detecting defects in pipes or other structures. 5,486,767, Cl. 324-715.000.
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Schwarz, Frank. Infrared detector for detecting motion and fire and an alarm system including the same. 5,486,810, Cl. 340-521.000.
Schwarz, Gerhard: *See*—
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Schwimmer, Robert L: *See*—
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Schwinderman, James A.; and Morrison, Robert C., to FMC Corporation. Lithium amide process. 5,486,343, Cl. 423-413.000.
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Jaw, Link C.; and Liu, Frank O., 5,485,868, Cl. 137-601.000.
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Dillner, Joakim; Lerner, Richard A.; Smith, Richard; and Parks, D. Elliot, 5,486,453, Cl. 435-5.000.
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Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Samra, Amarjit K., 5,486,309, Cl. 252-299.600.

SeaLite Sciences, Inc.: *See*—
Stults, Nancy L., 5,486,455, Cl. 435-6.000.

Searle, John G., to Rolls-Royce plc. Friction welding. 5,486,262, Cl. 156-580.000.

Sears, Charles F., Jr., to Dri-Air Industries, Inc. Hi-performance desiccant tower. 5,485,686, Cl. 34-473.000.

Seber, Brett P., to Buck Knives, Inc. Knife with fabric cutter. 5,485,677, Cl. 30-294.000.

Seckora, Michael C., to Tektronix, Inc. Repeatable finite and infinite impulse response integrated circuit structure. 5,487,023, Cl. 364-724.130.

Seely, Douglas D., III. Multiple year calendar. 5,485,692, Cl. 40-114.000.

Segler, Howard W.: *See*—
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Seibert, George M. Shooting range target. 5,486,425, Cl. 428-500.000.

Seidel, Christoph: *See*—
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Seiko Epson Corporation: *See*—
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Seiko Instruments Inc.: *See*—
Hirama, Hideo, 5,486,728, Cl. 310-40.0MM.
Saito, Yutaka; Osanai, Jun; Kojima, Yoshikazu; and Kamiya, Masaaki, 5,486,716, Cl. 257-360.000.
Takahashi, Kunihiro; Kojima, Yoshikazu; Takasu, Hiroaki; Matsuyama, Nobuyoshi; Niwa, Hitoshi; Yoshino, Tomoyuki; and Yamazaki, Tsuneo, 5,486,708, Cl. 257-59.000.

Seiko Seiki Kabushiki Kaisha: *See*—
Oda, Yoshimasa; and Koyano, Shinji, 5,485,910, Cl. 198-690.100.

Seiler, Hartmut; Haderer, Guenter; Aab, Volker; and Peter, Cornelius, to Robert Bosch GmbH. Device for detecting the movement of a movable component and signalling the detected movement over a single line. 5,486,759, Cl. 324-207.200.

Sejkora, Günther, to Zumtobel Licht GmbH. Lamp cover in particular for fluorescent lamps. 5,486,990, Cl. 362-309.000.

Seki, Kazuyuki: *See*—
Kitamoto, Yoshito; Takagi, Masahiro; Akiba, Hiroshi; and Seki, Kazuyuki, 5,486,276, Cl. 204-192.200.

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Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 5,486,848, Cl. 347-15.000.

Sekisui Fine Chemical Co., Ltd.: *See*—
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Sekita, Makoto: *See*—
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Selleri, Narciso; and Longhi, Giuliano, to Marposs Societa' Per Azioni. Apparatus for checking surface features of conical parts including a probe disposed within a transversal groove of a roller. 5,486,760, Cl. 324-262.000.

Sengupta, Louise; Ngo, Eric; Stowell, Steven; O'Day, Michelina; and Lancto, Robert, to United States of America, Army. Ceramic ferroelectric composite material - BSTO-ZrO_2 . 5,486,491, Cl. 501-137.000.

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Semendrey, Joseph S., to Rexam Industries Corp. Laminated fire resistant sheet material. 5,486,408, Cl. 428-220.000.

Serad, George A.: *See*—
Groeger, H. Gunter; Serad, George A.; and Felton, Clinton D., 5,486,410, Cl. 428-283.000.

Serv-Tech, Inc.: *See*—
Cradeur, Robert R., 5,485,966, Cl. 241-39.000.

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Billia, Mario; and Siladji, Sigrun, 5,486,353, Cl. 424-59.000.
Solesbee, Angela M.; and Hebert, Irene D. Strap for combining tracheotomy tube and moist air mask. 5,485,837, Cl. 128-207.170.
Solinst Canada Limited: *See*—
Toon, Donald A.; Nielsen, Per H.; and Skov, Bent, 5,485,881, Cl. 166-165.000.
Solomon, Peter R.: *See*—
Carangelo, Robert M.; Dettori, Mark D.; Grigely, Lawrence J.; Murray, Terence C.; Solomon, Peter R.; Van Dine, C. Peter; and Wright, David D., 5,486,917, Cl. 356-346.000.
Song, Geun H.: *See*—
Choi, Jeong D.; Cheon, In K.; Song, Geun H.; and Park, Hee Y., 5,486,958, Cl. 360-85.000.
Song, Joo H.; and Townsend, Donald J., to Wm. Wrigley Jr. Company. Continuous chewing gum base manufacturing process using a mixing-restriction element. 5,486,366, Cl. 426-5.000.
Songer, Jimmie D., to Magma, Inc. Method and apparatus for improving transmitted video signal structure. 5,486,874, Cl. 348-600.000.
Sony Corporation: *See*—
Hara, Nobuyuki; Kawamura, Akira; and Matsui, Takeshi, 5,486,841, Cl. 345-8.000.
Ishikawa, Nobuyuki; and Imai, Tadashi, 5,486,796, Cl. 331-117.00R.
Iwamura, Takashi; Matsuzawa, Yoko; and Tamura, Shin-Ichiro, 5,486,437, Cl. 369-288.000.
Maekawa, Itaru; Ohgihara, Takahiro; and Tanaka, Kuninobu, 5,486,787, Cl. 327-560.000.
Matsushige, Takashi, 5,487,067, Cl. 370-85.700.
Ohga, Norio; and Takeuchi, Koichi, 5,486,141, Cl. 472-60.000.
Oka, Nobuyuki, 5,487,047, Cl. 369-32.000.
Shimizume, Kazutoshi; and Nakamura, Shinobu, 5,486,827, Cl. 341-58.000.
Tanaka, Shigeo, 5,486,877, Cl. 348-722.000.
Tsuchiya, Takashi; and Ishii, Osamu, 5,486,128, Cl. 451-2.000.
Ueta, Motomu; and Harada, Tetsuya, 5,487,019, Cl. 364-514.00R.
Urata, Kaoru, 5,486,956, Cl. 360-65.000.
Wachi, Shigeaki, 5,487,056, Cl. 369-44.340.
Yagasaki, Yoichi, 5,486,862, Cl. 348-399.000.
Soprane S.A.: *See*—
Fournet-Fayard, Jacques; Galland, Olivier; Garin, Christophe; and Lucet, Alain, 5,486,174, Cl. 606-61.000.
Sorensen, Jens O. Air-pollution reduction method and system for the interior of an automobile. 5,486,138, Cl. 454-75.000.
Soundtech, Inc.: *See*—
Watson, Teddie G.; and Orth, Jeffrey L., 5,485,697, Cl. 43-42.310.
Southgate, Timothy J., to Altera Corporation. Computer user interface having tiled and overlapped window areas. 5,487,143, Cl. 395-157.000.
Southward, Steve C.: *See*—
Heath, Michael C.; and Southward, Steve C., 5,487,027, Cl. 364-851.000.
Southwest Research Institute: *See*—
Silvus, Howard S., Jr.; Mallow, William A.; Parr, Charles H.; and Dziuk, Jerome J., 5,486,768, Cl. 324-718.000.
Space Systems/Loral, Inc.: *See*—
Brydon, Louis B.; Moore, Samuel R.; and Lord, Peter W., 5,486,399, Cl. 428-99.000.
Spaeth, Horst: *See*—
Venetucci, Jim M.; and Spaeth, Horst, 5,485,731, Cl. 62-56.000.
Spagnoli, Leonardo: *See*—

Clementini, Luciano; Galambos, Adam F.; Lesca, Giuseppe; Spagnoli, Leonardo; Starsinic, Michael E.; and Ogale, Kumar, 5,486,419, Cl. 428-397.000.

Spalding, Richard E.: *See—*
Axline, Robert M., Jr.; Sloan, George R.; and Spalding, Richard E., 5,486,830, Cl. 342-43.000.

Sparks, Wanda F.: *See—*
Hamilton, Elizabeth M.; Lalli, Eric W.; Lubin, Cindy B.; Sparks, Wanda F.; and Waterland, Alfred F., III, 5,486,010, Cl. 277-1.000.

Spatenka, Gary W. Method for auto body repair. 5,486,321, Cl. 264-36.000.

SPECS Gesellschaft fur Oberflachenanalvtik and Computertechnologie mbH: *See—*
Muller, Karl-Heinz; and Oechsner, Hans, 5,486,696, Cl. 250-288.000.

Spector, George: *See—*
Wiggleton, Patsy A.; and Spector, George, 5,485,642, Cl. 7-151.000.

Speedfam Corporation: *See—*
Cesna, Joseph V.; and Van Woerkom, Anthony G., 5,486,131, Cl. 451-56.000.

Spence, Bridget A.: *See—*
Himes, Glenn R.; Spence, Bridget A.; Hoxmeier, Ronald J.; and Chin, Steven S., 5,486,574, Cl. 525-314.000.

Spence, John R.; Gupta, Rajiv; and Zhang, Mingming, to Rockwell International Corporation. Low power crystal oscillator. 5,486,795, Cl. 331-116.0FE.

Spencer, Elbert M.: *See—*
Laabs, Timothy P.; Misner, Michael O.; Schulz, Richard H.; and Spencer, Elbert M., 5,485,735, Cl. 70-358.000.

Spheric Audio Laboratories, Inc.: *See—*
Mark, Steven D.; and Doleshal, David, 5,487,113, Cl. 381-17.000.

Spike, Douglas L.: *See—*
Witler, James L.; Spike, Douglas L.; and Talbot, Douglas C., 5,486,002, Cl. 273-184.00R.

Spitalny, Paul; and Mallinson, Martin, to Analog Devices, Inc. Programmable gain amplifier. 5,486,791, Cl. 330-282.000.

Spitzer, Clarence J.: *See—*
Lamp, William G.; and Spitzer, Clarence J., 5,486,664, Cl. 200-297.000.

Sporn, Joseph S. Leash-controllable dog harness having protective sleeves. 5,485,810, Cl. 119-792.000.

Sporzynski, Robert S.: *See—*
Wagg, Theadore J.; Clark, James K.; and Sporzynski, Robert S., 5,485,678, Cl. 33-610.000.

Spracklen, John E.: *See—*
Popescu, Valeri; Schultz, Merle A.; Gibson, Gary A.; Spracklen, John E.; and Lightner, Bruce D., 5,487,156, Cl. 395-375.000.

Sprecker, Mark A.; Weiss, Richard A.; and Hanna, Marie R., to International Flavors & Fragrances Inc. 2-methoxy-4-formyl phenyl ester of propionic acid and use in augmenting or enhancing the aroma of perfume compositions, colognes and perfumed articles. 5,486,502, Cl. 512-21.000.

Springs Window Fashions Division, Inc.: *See—*
Genova, John R., 5,485,875, Cl. 160-168.100.

Spurr, Dion: *See—*
Kettelson, Russell W.; and Spurr, Dion, 5,485,911, Cl. 198-791.000.

Spurzem, Heinrich: *See—*
Jobelius, Klaus-Dieter; Morgen, Helmut; Spurzem, Heinrich; and Völpel, Stefan, 5,485,987, Cl. 267-64.280.

Square D Company: *See—*
Wong, Tak M.; Etsheidt, Ronald J.; and Freilinger, Patrick L., 5,486,666, Cl. 200-304.000.

St. Joseph Health Centre: *See—*
Ballagh, Robert H.; and Jones, Jeff B., 5,486,360, Cl. 424-94.400.

Stabilus GmbH: *See—*
Jobelius, Klaus-Dieter; Morgen, Helmut; Spurzem, Heinrich; and Völpel, Stefan, 5,485,987, Cl. 267-64.280.

Stachowiak, Anthony A.: *See—*
Heisler, William A.; Shipman, David A.; Stachowiak, Anthony A.; Bodden, Kurt S.; Wurth, Michael E.; and Dellekoenig, Norbert, 5,486,042, Cl. 312-196.000.

Stahl, Julie B.: *See—*
Coleman, Patrick L.; Heilmann, Steven M.; Kangas, Steven L.; Rasmussen, Jerald K.; Rolando, Richard J.; and Stahl, Julie B., 5,486,358, Cl. 424-78.230.

Stalder, Roland E.; Van Zandt, Thomas R.; Hecht, Michael H.; and Grunthaner, Frank J., to California Institute of Technology. Array of micro-machined mass energy micro-filters for charged particles. 5,486,697, Cl. 250-305.000.

Stallbaumer, Richard J.: *See—*
Pitman, Raymond F.; Stallbaumer, Richard J.; and Rusk, James A., 5,486,084, Cl. 414-694.000.

Stamet, Inc.: *See—*
Hay, Andrew G., 5,485,909, Cl. 198-642.000.

Standard Oil Company, The: *See—*
Curatolo, Benedict S.; Li, George S.; and Giddings, Brandford E., 5,486,409, Cl. 428-221.000.

Standard Register Company, The: *See—*
Lakes, A. Dale, 5,486,436, Cl. 430-11.000.
Laurash, David F., 5,486,021, Cl. 283-81.000.

Stanford, Ralph F.; and Gatz, Stephen E., to Elkay Manufacturing Company. Mounting head with safety shut-off valve for replaceable filter cartridge. 5,486,288, Cl. 210-235.000.

Stansbury, Darryl M.: *See—*
Cathey, David A.; Hofmann, James J.; Dynka, Danny; and Stansbury, Darryl M., 5,486,126, Cl. 445-25.000.

Starsinic, Michael E.: *See—*
Clementini, Luciano; Galambos, Adam F.; Lesca, Giuseppe; Spagnoli, Leonardo; Starsinic, Michael E.; and Ogale, Kumar, 5,486,419, Cl. 428-397.000.

Stasaitis, Linas: *See—*
Wenke, Gottfried; Pan, Yuh-Guo; Lim, Mu-Ill; and Stasaitis, Linas, 5,486,619, Cl. 548-508.000.

St. Clair, David J., to Shell Oil Company. Polyurethane sealants and adhesives containing saturated hydrocarbon polyols. 5,486,570, Cl. 525-123.000.

St. Clair, David J.: *See—*
Bening, Robert C.; and St. Clair, David J., 5,486,568, Cl. 525-102.000.

Steagall, Paul H., III: *See—*
Booth, Hubert J.; Steagall, Paul H., III; and Wright, Michael W., 5,485,964, Cl. 241-27.000.

Steed, Gary: *See—*
Olson, Todd; Meiser, Dan; Steed, Gary; Huffman, Eric; Otten, Matthew; VanOverloop, Ronald; Powell, Darrel; Knodell, Thomas; Rhad, Edward; Chen, Ralph; and Cook, Robert, 5,485,947, Cl. 227-176.100.

Steel, Katherine I. M.: *See—*
Kalindjian, Sarkis B.; Broughton, Howard B.; Low, Caroline M. R.; McDonald, Iain M.; Hull, Robert A. D.; Shankley, Nigel P.; Buck, Ildiko M.; Steel, Katherine I. M.; and Davies, Jonathan M. R., 5,486,597, Cl. 530-331.000.

Steelcase, Inc.: *See—*
Heisler, William A.; Shipman, David A.; Stachowiak, Anthony A.; Bodden, Kurt S.; Wurth, Michael E.; and Dellekoenig, Norbert, 5,486,042, Cl. 312-196.000.

Steele, James R.: *See—*
Michal, Ronald J.; Steele, James R.; and Jones, Mark E., 5,486,916, Cl. 356-345.000.

Steenborg, Manfred, to ERNO Raumfahrttechnik GmbH. Arcjet for a space flying body. 5,485,721, Cl. 60-203.100.

Steffens, Charles E., Jr., to TRW Vehicle Safety Systems Inc. Seat belt pretensioner. 5,485,970, Cl. 242-374.000.

Steffens, Charles E., Jr.: *See—*
Brown, Louis R.; Steffens, Charles E., Jr.; Kroetsch, Charles E.; and Robbins, Delmar H., 5,485,758, Cl. 73-865.800.

Stegmann, Robert. Method and appliance for maintaining the natural intraocular pressure. 5,486,165, Cl. 609-294.000.

Stein, Jeffrey: *See—*
Hirshowitz, Bernard; Levy, Amnon; Gilat, Alexander R.; Rogel, Eitan; Stein, Jeffrey; and Borgia, Julian, 5,486,196, Cl. 606-218.000.

Stein, Manfred: *See—*
Bastian, Udo; and Stein, Manfred, 5,486,384, Cl. 427-493.000.

Steinfels, Victor E., III. Product accessible display container. 5,485,913, Cl. 206-45.190.

Steinke, David M.: *See—*
Romesberg, Floyd E.; and Steinke, David M., 5,486,256, Cl. 156-251.000.

Stephen, Robert L.: *See—*
Rossi, Cino; Eruzzi, Silvio; Stephen, Robert L.; and Lugnani, Franco, 5,486,160, Cl. 604-21.000.

Stephens, Donald E.: *See—*
Jones, Oliver D.; and Stephens, Donald E., 5,486,134, Cl. 451-209.000.

Stephens, Joseph C.: *See—*
Helfrich, Kenneth J.; Stephens, Joseph C.; McClain, Kevin E.; and Lee, Brian, 5,486,866, Cl. 348-500.000.

Sterling, Jeff; Levy, Ruth; Veinberg, Alex; Goldenberg, Willy; Finberg, John; Youdim, Musa; and Gutman, Arieh, to Teva Pharmaceutical Industries, Ltd. Monofluorinated derivatives of N-propargyl-1-aminoindan and their use as inhibitors of monoamine oxidase. 5,486,541, Cl. 514-657.000.

Stevens, David E.; and Temme, Leonard A., to United States of America, Navy. Artificial horizon altitude warning system. 5,486,821, Cl. 340-970.000.

Stevens, David R. F.: *See—*
McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,066, Cl. 370-85.200.

Stevens, James C.: *See—*
Devore, David D.; Timmers, Francis J.; Stevens, James C.; and Rosen, Robert K., 5,486,632, Cl. 556-11.000.

Stevens, Timothy J.; and Kruskopf, David J., to EasyMove, Inc. Apparatus for excavating and transplanting trees and the like and method of use. 5,485,691, Cl. 37-302.000.

Stewart, Mark F.; Bonetta, Angelo A.; and Phull, Majinder S., to High Flyte International Ltd. Automated dart board. 5,486,007, Cl. 273-374.000.

Stiles, Parks W.: *See—*
Welborn, Lynn C.; Stiles, Parks W.; and Venegas, José I., 5,485,666, Cl. 29-436.000.

Stohs, Miriam: *See—*
Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Stohs, Miriam; Colley, James D.; and Hargrove, Oliver W., Jr., 5,486,342, Cl. 423-243.010.

Stoll, Kurt, to Festo KG. Choke valve. 5,485,867, Cl. 137-599.000.

Stone, W. Ross; Palmer, Robert L.; Mochel, Virgil D.; and Karpinski, Robert P., to Bridgestone/Firestone, Inc. Tire cure control system and method. 5,486,319, Cl. 264-406.000.

Stoodley, Kevin A.: *See*—
Amelina, Iam R.; Mooney, David M.; and Stoodley, Kevin A., 5,487,158, Cl. 395-375.000.

Storage Technology Corporation: *See*—
Dodt, William C.; Gottehrer, Terry R.; and Milligan, Charles A., 5,487,171, Cl. 395-840.000.

Stork RMS B.V.: *See*—
Bernardus, Wilhelmus A.; and Pardijs, Hendrik J., 5,486,145, Cl. 452-58.000.

Stormbom, Lars: *See*—
Antikainen, Veijo; Paukkunen, Ari; Stormbom, Lars; Jauhiainen, Hannu; and Ponkala, Jorma, 5,485,747, Cl. 73-335.030.

Stough, Ronald A., to E-Z Taping System, Inc. Self-release self-adhesive drywall tape. 5,486,394, Cl. 428-61.000.

Stowell, Steven: *See*—
Sengupta, Louise; Ngo, Eric; Stowell, Steven; O'Day, Michelina; and Lancto, Robert, 5,486,491, Cl. 501-137.000.

Strand, Timothy C.: *See*—
Rosen, Hal J.; Rubin, Kurt A.; and Strand, Timothy C., 5,487,060, Cl. 369-118.000.

Strat, Askold: *See*—
Bard, Simon; Strat, Askold; and Dvorkis, Paul, 5,486,944, Cl. 359-198.000.

Straub, Beat: *See*—
Philipp, Florian; Hautle, Alfred; Nuesch, Reto; and Straub, Beat, 5,485,684, Cl. 34-226.000.

Streamlight, Inc.: *See*—
Sharrah, Raymond L.; and Craft, Charles W., 5,486,432, Cl. 429-99.000.

Streck, Donald A., to Showa Hatsumei Kaisha, Ltd. Passive protector for hypodermic needles. 5,486,164, Cl. 604-198.000.

Strickland, Timothy A.: *See*—
Knowlton, Christopher M.; O'Hara, Robert J.; and Strickland, Timothy A., 5,485,653, Cl. 15-340.400.

Stringfellow, Steven A.: *See*—
Borrego, Diego A.; Greenland, Alan R.; Allison, Charles R.; Bordo, Robert A.; and Stringfellow, Steven A., 5,486,840, Cl. 345-7.000.

Strinning, Per E.: *See*—
Borg, Torolf; and Strinning, Per E., 5,486,092, Cl. 415-225.000.

Strohl, Willi: *See*—
Treiber, Juergen; Kuehn, Michael; Rollwage, Mathias; Trachte, Dietrich; and Strohl, Willi, 5,486,087, Cl. 415-55.100.

Strott, Douglas B.: *See*—
Charboneau, Thomas J.; Strott, Douglas B ; Sogge, Dale R.; and Maher, Thomas R., 5,486,976, Cl. 361-283.400.

Strunk, Richard J.; and Bell, Allyn R., to Uniroyal Chemical Company, Inc. Pyrimidylbensulfonyl chloride compounds. 5,486,610, Cl. 544-311.000.

Stubbs, George. Apparatus for withdrawing fluid or tissue from a patient's body. 5,485,853, Cl. 128-752.000.

Stüber, Dietrich: *See*—
Lesslauer, Werner; Lötscher, Hansruedi; and Stüber, Dietrich, 5,486,463, Cl. 435-69.500.

Stults, Nancy L., to SeaLite Sciences, Inc. Photoprotein conjugates and methods of use thereof. 5,486,455, Cl. 435-6.000.

Sturman, Oded E. Fuel injector with an internal pump. 5,485,957, Cl. 239-88.000.

Suda, Yasuo: *See*—
Suzuki, Kenji; Ishizaki. Akira; Ohtaka, Keiji; Suda, Yasuo; Fukahori, Hidehiko; Nagano, Akihiko; Konishi, Kazuki; and Tsunekawa, Tokuichi, 5,486,892, Cl. 354-402.000.

Sudo, Shigeru, to National Institute for Fusion Science, The Director-General of the. Double-layer pellet, method of manufacturing the same, and apparatus for manufacturing the same. 5,487,094, Cl. 376-100.000.

Sudo, Shoichi: *See*—
Ohishi, Yasutake; Kanamori, Terutoshi; Nishida, Yoshiki; Mori, Atsushi; and Sudo, Shoichi, 5,486,947, Cl. 359-341.000.

Sugano, Toshihiko: *See*—
Fujita, Takashi; and Sugano, Toshihiko, 5,486,572, Cl. 525-247.000.

Sugawa, Satoshi: *See*—
Ito, Michio; Sugawa, Satoshi; and Yanagida, Atsushi, 5,486,479, Cl. 436-533.000.

Sugawara, Kiyomi: *See*—
Ishitaka, Yoshihiko; Sato, Yumiko; Abe, Munemitsu; Sasaki, Yorihiko; Kano, Mitsuru; Sato, Arao; and Sugawara, Kiyomi, 5,486,403, Cl. 428-167.000.

Sugawara, Shigeru: *See*—
Kamohara, Eiji; Sugawara, Shigeru; and Kimiya, Junichi, 5,486,735, Cl. 313-414.000.

Sugimoto, Akinori; Mori, Atsushi; and Nanno, Kunio, to Honda Giken Kogyo Kabushiki Kaisha. Parking brake system. 5,485,764, Cl. 74-535.000.

Sugiura, Hirotaka: *See*—
Asano, Hiroaki; Kobayashi, Yasuhiro; Hotta, Shigeo; Yamakawa, Yoichi; Ito, Akira; and Sugiura, Hirotaka, 5,485,752, Cl. 73-660.000.

Sugiura, Muneharu: *See*—
Imai, Hitoshi; Sugiura, Muneharu; and Hoashi, Katsutoshi, 5,486,948, Cl. 359-462.000.

Sugiura, Souichi; Watanabe, Hidehiro; and Yoshida, Seiko, to Kabushiki Kaisha Toshiba. Semiconductor device including insulating film arrangement having low reflectance. 5,486,719, Cl. 257-641.000.

Sugiyama, Kazuhide: *See*—
Yamaguchi, Yukuo; Onuki, Kazuhiko; and Sugiyama, Kazuhide, 5,486,882, Cl. 353-77.000.

Sugiyama, Toshihiro: *See*—
Takenaka, Eiji; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Sugiyama, Toshihiro; Yamanaka, Tetsuo; Murakami, Eisaku; and Komatsubara, Satoru, 5,486,909, Cl. 355-259.000.

Suh, Jung S.; and Lee, Sang S., to Samsung Electronics Co., Ltd. Musical medley function controlling method in a televison with a video/accompaniment-music player. 5,486,645, Cl. 84-610.000.

Suh, Jung W.: *See*—
Lee, Yong W.; Lee, Yeong S.; Yon, Chang S.; Suh, Jung W.; Lee, Chul H.; Lim, Yoong H.; and Yoo, Ick D., 5,486,630, Cl. 554-1.000.

Sukegawa, Shunichi, to Texas Instruments Incorporated. Semiconductor memory device. 5,487,039, Cl. 365-200.000.

Sukegawa, Shunichi; and Saeki, Tetsuya, to Texas Instruments Incorporated; and Hitachi Ltd. Semiconductor memory device and defective memory cell repair circuit. 5,487,040, Cl. 365-200.000.

Sulfstede, Louis E.: *See*—
Guy, Stephen E.; Sulfstede, Louis E.; and Hillmer, Eric, 5,485,954, Cl. 236-78.00R.

Sullivan, Patrick, to Cray Research, Inc. Boundary scan testing using clocked signal. 5,487,074, Cl. 371-22.300.

Sumitomo Chemical Company, Limited: *See*—
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Harada, Naoki; Kayane, Yutaka; and Omura, Takashi, 5,486,607, Cl. 544-76.000.

Sumitomo Chemical Co., Ltd.: *See*—
Kimura, Junichi; Wakamatsu, Kazuki; Usui, Masahito; and Satoh, Makoto, 5,486,415, Cl. 428-349.000.

Sumitomo Electric Industries, Ltd.: *See*—
Honda, Masaaki; and Ihara, Tomohiko, 5,486,220, Cl. 55-487.000.
Shibata, Kenichiro; Hatta, Toshiyuki; Matsuyama, Fumio; Miyamoto, Masahiro; Okui, Manabu; and Nishi, Masaya, 5,485,950, Cl. 228-194.000.
Tenmoku, Kenji; Inoue, Takuya; and Hashimoto, Takeo, 5,486,822, Cl. 340-995.000.

Sumitomo Metal Industries, Ltd.: *See*—
Kishimoto, Yoshihisa; Hiraishi, Nobushige; Takahashi, Wataru; Ohkita, Masakazu; Ishigaki, Naoyuki; and Matsuura, Yutaka, 5,486,224, Cl. 75-254.000.

Sumitomo Metal Mining Company, Limited: *See*—
Sato, Naohumi; and Yanagisawa, Yasuhiro, 5,486,722, Cl. 257-666.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Kawasaki, Atsuko; Nakashita, Takefumi; Inui, Yoshiharu; and Shirouzu, Toshimichi, 5,486,194, Cl. 606-203.000.
Kikuchi, Nobuyuki; Ookochi, Katsuaki; Onuki, Masatsugu; and Yarimizu, Kazuaki, 5,486,261, Cl. 156-422.000.

Sumitomo Special Metals Co., Ltd.: *See*—
Kawakami, Makoto; and Yamaguchi, Shigeru, 5,486,756, Cl. 324-127.000.
Kishimoto, Yoshihisa; Hiraishi, Nobushige; Takahashi, Wataru; Ohkita, Masakazu; Ishigaki, Naoyuki; and Matsuura, Yutaka, 5,486,224, Cl. 75-254.000.

Sumitomo Wiring Systems, Ltd.: *See*—
Aoyama, Masahiko, 5,486,434, Cl. 429-178.000.
Miyazaki, Sho, 5,486,123, Cl. 439-825.000.
Nabeshima, Akira; Watanabe, Kaoru; and Saba, Toshikazu, 5,486,119, Cl. 439-489.000.

Summers, James B., Jr.; Davidsen, Steven K.; Curtin, Michael L.; Heyman, H. Robin; Sheppard, George S.; Xu, Lianhong; Carrera, George M., Jr.; and Garland, Robert B., to Abbott Laboratories. Platelet activating factor antagonists: imidazopyridine indoles. 5,486,525, Cl. 514-303.000.

Summers, Thomas W. Vehicle. 5,485,893, Cl. 180-219.000.

Sundaram, Lalgudi M. G., to Motorola, Inc. Method for forming a lateral bipolar transistor. 5,486,481, Cl. 437-31.000.

Sundquist, Drew A.: *See*—
Watson, Will; Miller, Alan L.; Sundquist, Drew A.; Simpson, Roger T.; Ducklow, Diane K.; Beckerman, Joseph W.; and Showalter, Dan J., 5,485,894, Cl. 180-248.000.

Sung, Ki Y., to Hyundai Electronics Industries Co., Inc. Common control redundancy switchi method for switching a faulty active common control unit with an inactive spare common control unit. 5,487,149, Cl. 395-182.080.

Sunsmart Inc.: *See*—
Mitchnick, Mark; and O'Lenick, Anthony J., Jr., 5,486,631, Cl. 556-10.000.

Surber, Kevin J.: *See*—
Martin, Robert W.; Miller, Mark S.; and Surber, Kevin J., 5,486,372, Cl. 426-565.000.

Surka, Stefan, to United Parcel Service. Method and apparatus for determining the fine angular orientation of bar code symbols in two-dimensional CCD images. 5,487,115, Cl. 382-296.000.

Sutherland, Robert J., to Shell Oil Company. Process for making dispersant viscosity index improvers. 5,486,563, Cl. 524-534.000.

Sutton, Robert A., to BellSouth Corporation. End office of a telephone system with a zero loss plan. 5,487,109, Cl. 379-410.000.

Suzaki, Motohiro: *See*—
Miyamoto, Takeshi; Okumura, Kouji; and Suzaki, Motohiro, 5,486,908, Cl. 355-290.000.

Suzuki, Haruyuki, to Ricoh Company, Ltd. Information recorder with tracking and seeking operations using low frequency tracking and lens position signals. 5,487,055, Cl. 369-44.280.

Suzuki, Hideharu: *See*—
Nishimura, Kazutoshi; Sakamoto, Hideki; and Suzuki, Hideharu, 5,487,035, Cl. 365-189.020.
Suzuki, Hidekazu; Harara, Mitsuhiko; and Tanaka, Tadao, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Control system and control method for controlling power steering apparatus. 5,487,007, Cl. 364-424.050.
Suzuki, Katsuaki: *See*—
Komori, Naoki; Morita, Akio; and Suzuki, Katsuaki, 5,487,148, Cl. 395-182.020.
Suzuki, Kenji; Ishizaki, Akira; Ohtaka, Keiji; Suda, Yasuo; Fukahori, Hidehiko; Nagano, Akihiko; Konishi, Kazuki; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Camera with visual axis detecting device. 5,486,892, Cl. 354-402.000.
Suzuki, Koichi: *See*—
Kashizaki, Yoshio; Miyazaki, Hajime; Suzuki, Koichi; Go, Shintetsu; and Sato, Kazuma, 5,486,440, Cl. 430-62.000.
Suzuki, Kyoji: *See*—
Emi, Shingo; Suzuki, Kyoji; and Ikada, Yoshito, 5,486,606, Cl. 536-84.000.
Suzuki, Nobuhiro; Kitada, Chieko; and Tsuda, Masao, to Takeda Chemical Industries, Ltd. Monoclonal antibodies to PACAP. 5,486,472, Cl. 435-240.270.
Suzuki, Nobuyoshi, to Heian Corporation. Positioning rule stopper apparatus in a numerical control router. 5,486,746, Cl. 318-569.000.
Suzuki, Seiichi; and Murayama, Keijiro, to Max Co., Ltd. Binding machine. 5,485,711, Cl. 53-138.400.
Suzuki, Suguru: *See*—
Mulvihill, Eileen R.; Yoshitake, Shinji; Ikeda, Yasunori; Suzuki, Suguru; Hashimoto, Akira; Yuzuriha, Teruaki; and Nexo, Bjorn A., 5,486,471, Cl. 435-226.000.
Suzuki, Takamitu: *See*—
Mori, Yukio; Kihara, Noriyasu; and Suzuki, Takamitu, 5,485,746, Cl. 73-202.000.
Suzuki, Takuji: *See*—
Aida, Satoshi; Shibata, Mariko; Fujimoto, Katsuhiko; Ishibashi, Yoshiharu; Suzuki, Takuji; Sato, Kozo; and Itoh, Ayao, 5,485,839, Cl. 128-653.100.
Suzuki, Tetsuji: *See*—
Negishi, Ichiro; Suzuki, Tetsuji; Koyama, Fujiko; Uchiyama, Yuji; Bonde, Hiroyuki; Konno, Toshio; Takahashi, Ryusaku; and Shou, Toshiaki, 5,486,878, Cl. 348-757.000.
Suzuki, Tetsuro: *See*—
Shoshi, Masayuki; Shimoda, Masakatsu; Konishi, Akiko; Kawahara, Megumi; Kojima, Akio; Suzuki, Tetsuro; and Yoshikawa, Masao, 5,486,438, Cl. 430-58.000.
Suzuki, Tomio: *See*—
Takeya, Fuminori; and Suzuki, Tomio, 5,486,969, Cl. 360-127.000.
Suzuki, Tomohiro, to Uniden Corporation. Integrated port selection circuit for high frequency signal. 5,486,797, Cl. 333-104.000.
Suzuki, Yasuo: *See*—
Ward, Peter A.; Miyasaka, Masayuka; and Suzuki, Yasuo, 5,486,536, Cl. 514-460.000.
Sverlow, Genadie G.: *See*—
della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., 5,486,351, Cl. 424-59.000.
Swain, Eugene A., to Xerox Corporation. Substrate holding apparatus. 5,486,028, Cl. 294-93.000.
Swan, David W.: *See*—
Smith, David P. H.; Leonard, Mark T.; and Swan, David W., 5,486,857, Cl. 347-224.000.
Swanepoel, Adriaan R., to Adriaan Retief Swanepoel. Windscreen wiper with elongated, curved backbone. 5,485,650, Cl. 15-250.430.
Swanson, David K.: *See*—
Panescu, Dorin; and Swanson, David K., 5,485,849, Cl. 128-699.000.
Sweco, Incorporated: *See*—
Zaun, Jochim M., 5,485,924, Cl. 209-300.000.
Swenson, Rolf E.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Swenson, Rolf E., 5,486,636, Cl. 556-443.000.
Swisher, Curtis N.: *See*—
Quarderer, George J., Jr.; Swisher, Curtis N.; and Trent, David L., 5,486,627, Cl. 549-521.000.
Switchcraft Inc.: *See*—
Lau, Frederick L., 5,485,673, Cl. 29-883.000.
Sykes, Christopher C., to International Fuel Cells Corporation. Cabinet structures coupled to adjacent cabinet structures and to rectangular frame elements, and equipped with anti-tilt mechanisms and rolling and sliding bases. 5,486,041, Cl. 312-111.000.
Symbios Logic Inc.: *See*—
Bemis, Edward D., 5,487,160, Cl. 395-441.000.
Symbol Technologies, Inc.: *See*—
Bard, Simon; Strat, Askold; and Dvorkis, Paul, 5,486,944, Cl. 359-198.000.
Symetrix Corporation: *See*—
Mihara, Takashi; Watanabe, Hitoshi; Yoshimori, Hiroyuki; Paz de Araujo, Carlos A.; and McMillan, Larry D., 5,487,032, Cl. 365-145.000.
Szemerédi, Katalin: *See*—
Bajnógel, Judit; Blaskó, Gábor; Budai, Zoltán; Schmidt, Éva; Egyed, András; Fekete, Márton; Gacsályi, István; Gyertyán, István; Mezei, Tibor; Reiter née Esses, Kalára; Simig, Gyula; Szemerédi, Katalin; and Szirt née Kiszelly, Enikő, 5,486,528, Cl. 514-331.000.
Szirt née Kiszelly, Enikő: *See*—
Bajnógel, Judit; Blaskó, Gábor; Budai, Zoltán; Schmidt, Éva; Egyed, András; Fekete, Márton; Gacsályi, István; Gyertyán, István; Mezei, Tibor; Reiter née Esses, Kalára; Simig, Gyula; Szemerédi, Katalin; and Szirt née Kiszelly, Enikő, 5,486,528, Cl. 514-331.000.
T. J. Hale Company: *See*—
Felton, J. Reed, 5,485,928, Cl. 211-52.000.
T&N Technology Limited: *See*—
Marks, Kevin T.; Salter, Nigel D.; Remedios, Rosario; and Waddington, Peter, 5,485,665, Cl. 29-407.000.
Tada, Yoshiaki: *See*—
Shindo, Naoaki; Kita, Takehide; Matsudaira, Nagahisa; Kobayashi, Akihiko; Tada, Yoshiaki; Sato, Takashi; and Sato, Atsushi, 5,486,933, Cl. 359-2.000.
Taguchi, Hideo: *See*—
Kashikie, Junsuke; and Taguchi, Hideo, 5,485,659, Cl. 24-71.00J.
Taherian, M. Reza; and Habashy, Tarek M., to Schlumberger Technology Corporation. Microwave device and method for measuring multiphase flows. 5,485,743, Cl. 73-61.440.
Tai, David. Adapter mechanism for extracting and retracting video tape from miniature cassettes. 5,486,959, Cl. 360-94.000.
Taimei Kagaku Kogyo Kabushiki Kaisha: *See*—
Katsuoka, Kyuji; Harumiya, Noriho; Hashizume, Tadahiro; and Kitahara, Tadashi, 5,486,497, Cl. 501-95.000.
Taiwan Semiconductor Manuf. Company: *See*—
Tsai, Chia S.; and Chang, Tien C., 5,486,266, Cl. 156-657.100.
Takach, Stephen J. Head vibrator. 5,486,156, Cl. 601-70.000.
Takado, Kanemasa; and Murakami, Tatsuo, to Fuji Chemical Industry Co., Ltd. Calcium hydrogen phosphate, a method for preparing it, and an excipient utilizing it. 5,486,365, Cl. 424-602.000.
Takagi, Masahiro: *See*—
Kitamoto, Yoshito; Takagi, Masahiro; Akiba, Hiroshi; and Seki, Kazuyuki, 5,486,276, Cl. 204-192.200.
Takagi, Mitsuo: *See*—
Fujita, Hiroyuki; Yoshida, Iwao; Takagi, Mitsuo; Manabe, Sadao; and Fukai, Konosuke, 5,486,473, Cl. 435-240.200.
Takagi, Tadao, to Nikon Corporation. Camera having a display for predicted images. 5,486,893, Cl. 354-410.000.
Takagiwa, Hiroyuki: *See*—
Fujii, Yozo; Moriguchi, Hiroyuki; Ikunami, Yoshikazu; Matsunawa, Masahiko; Tamura, Akihiko; Yasuda, Kazuo; Miwa, Tadashi; Horiuchi, Tatsumi; Kishimoto, Tadao; Fujimaki, Yoshihide; Takagiwa, Hiroyuki; and Tamura, Takashi, 5,486,898, Cl. 355-200.000.
Takahashi, Akira: *See*—
Murakami, Yoshiteru; Iketani, Naoyasu; Takahashi, Akira; and Ohta, Kenji, 5,486,395, Cl. 428-64.300.
Takahashi, Kimikazu; Mitake, Haruko; and Fujimura, Shigeru, to Yokogawa Electric Corporation. Scheduling system. 5,487,144, Cl. 395-161.000.
Takahashi, Kinya: *See*—
Nozawa, Yusaku; Ohtsu, Wataru; Ichiki, Nobuhiko; Ino, Kazuyuki; Matsuzaki, Hiroshi; and Takahashi, Kinya, 5,485,724, Cl. 60-421.000.
Takahashi, Kunihiro; Kojima, Yoshikazu; Takasu, Hiroaki; Matsuyama, Nobuyoshi; Niwa, Hitoshi; Yoshino, Tomoyuki; and Yamazaki, Tsuneo, to Seiko Instruments Inc. Light valve device using semiconductive composite substrate. 5,486,708, Cl. 257-59.000.
Takahashi, Masanori; Nagano, Tadashi; Mori, Hideko; and Kiyono, Masaki, to Mitsubishi Electric Industrial Co., Ltd. Syntactic analysis apparatus. 5,487,000, Cl. 364-419.080.
Takahashi, Masashi: *See*—
Watanabe, Takeshi; Yoshida, Minoru; Fujiwara, Shigeru; and Takahashi, Masashi, 5,486,907, Cl. 355-219.000.
Takahashi, Miyao: *See*—
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Harada, Naoki; Kayane, Yutaka; and Omura, Takashi, 5,486,607, Cl. 544-76.000.
Takahashi, Naohiko: *See*—
Matsushita, Osami; Yoneyama, Mitsuho; Takahashi, Naohiko; Fukushima, Yasuo; Hiroshima, Minoru; Kaneki, Tadashi; Abe, Yoshiaki; and Sakanashi, Naofumi, 5,486,729, Cl. 310-90.500.
Takahashi, Ryusaku: *See*—
Negishi, Ichiro; Suzuki, Tetsuji; Koyama, Fujiko; Uchiyama, Yuji; Bonde, Hiroyuki; Konno, Toshio; Takahashi, Ryusaku; and Shou, Toshiaki, 5,486,878, Cl. 348-757.000.
Takahashi, Setsuo: *See*—
Yanagi, Junichirou; Takase, Akihiko; and Takahashi, Setsuo, 5,487,062, Cl. 370-16.100.
Takahashi, Wataru: *See*—
Kishimoto, Yoshihisa; Hiraishi, Nobushige; Takahashi, Wataru; Ohkita, Masakazu; Ishigaki, Naoyuki; and Matsuura, Yutaka, 5,486,224, Cl. 75-254.000.
Takasago International Corporation: *See*—
Matsushima, Yoshimasa; and Hagiwara, Toshimitsu, 5,486,441, Cl. 430-74.000.
Takase, Akihiko: *See*—
Yanagi, Junichirou; Takase, Akihiko; and Takahashi, Setsuo, 5,487,062, Cl. 370-16.100.
Takasu, Hiroaki: *See*—

Takahashi, Kunihiro; Kojima, Yoshikazu; Takasu, Hiroaki; Matsuyama, Nobuyoshi; Niwa, Hitoshi; Yoshino, Tomoyuki; and Yamazaki, Tsuneo, 5,486,708, Cl. 257-59.000.

Takasugi, Satoru: *See*—
Hosono, Hitoshi; and Takasugi, Satoru, 5,486,449, Cl. 430-328.000.

Takatori, Yasushi: *See*—
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 5,486,848, Cl. 347-15.000.

Takeda, Atsushi; Koike, Michiro; Saito, Hironobu; and Katsumi, Toru, to Canon Kabushiki Kaisha. Developing agent recovery apparatus and image forming apparatus using such recovery apparatus. 5,486,905, Cl. 355-215.000.

Takeda Chemical Industries, Ltd.: *See*—
Suzuki, Nobuhiro; Kitada, Chieko; and Tsuda, Masao, 5,486,472, Cl. 435-240.270.
Uda, Yoshiaki; Nishida, Yoko; and Ogawa, Yasuaki, 5,486,508, Cl. 514-58.000.

Takeda, Shohei: *See*—
Miyamoto, Ryosuke; Sekita, Makoto; and Takeda, Shohei, 5,486,861, Cl. 348-362.000.

Takenaka, Eiji; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Sugiyama, Toshihiro; Yamanaka, Tetsuo, Murakami, Eisaku; and Komatsubara, Satoru, to Ricoh Company, Ltd. Developing device for an image forming apparatus. 5,486,909, Cl. 355-259.000.

Takenouchi, Tomoo; Ichinomiya, Yoshiaki; Ishizaka, Junji; Itagaki, Junji; Ohhashi, Shuzo; Azuma, Tsukasa; and Tanaka, Yasuhiko, to Japan Steel Works, Ltd., The. Electrode for electroslag remelting and process of producing alloy using the same. 5,487,082, Cl. 373-42.000.

Takeshita, Takuo: *See*—
Nakayama, Ryoji; Takeshita, Takuo; and Ishill, Yoshinari, 5,486,239, Cl. 148-101.000.

Takeuchi, Ikuo: *See*—
Kanno, Satoru; Katsumi, Toru; and Takeuchi, Ikuo, 5,486,903, Cl. 355-208.000.

Takeuchi, Koichi: *See*—
Ohga, Norio; and Takeuchi, Koichi, 5,486,141, Cl. 472-60.000.

Takeuchi, Masamitsu; Ishihama, Kazuyoshi; and Ikei, Kazunori, to Kabushiki Kaisha Komatsu Siesakusho. Pressure compensation valve. 5,485,864, Cl. 137-118.000.

Takeuchi, Seiji: *See*—
Tsuji, Toshihiko; Takeuchi, Seiji; Miyazaki, Kyoichi; Yoshii, Minoru; Nose, Noriyuki; and Mori, Tetsuzo, 5,486,919, Cl. 356-349.000.

Takeya, Fuminori; and Suzuki, Tomio, to NGK Insulators, Ltd. Magnetic head core having ferrite member reinforced by non-magnetic material. 5,486,969, Cl. 360-127.000.

Takeyasu, Nobuyuki: *See*—
Yamamoto, Hiroshi; Takeyasu, Nobuyuki; and Ohta, Tomohiro, 5,486,492, Cl. 437-192.000.

Takigawa, Akio: *See*—
Yano, Yuichi; Kinugasa, Naoki; and Takigawa, Akio, 5,486,937, Cl. 359-51.000.

Takiishi, Antonio I., to Eaton Corporation. Flexible connector for a circuit interrupter. 5,486,662, Cl. 200-50.0AA.

Takimoto, Akio; Wakemoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, to Matsushita Electric Industrial Co., Ltd. Organic polymer and preparation and use in crystal spatial light modulator. 5,486,442, Cl. 430-78.000.

Takizawa, Kuniharu: *See*—
Fujikake, Hideo; Takizawa, Kuniharu; Hirose, Juichi; and Kobayashi, Tatsushi, 5,486,936, Cl. 359-51.000.

Talbert, Lloyd G.; and Brazil, Stephen M., to Alumina Ceramics Co. (ACI). Graphite-loaded silicon carbide. 5,486,496, Cl. 501-90.000.

Talbot, Douglas C.: *See*—
Witler, James L.; Spike, Douglas L.; and Talbot, Douglas C., 5,486,002, Cl. 273-184.00R.

Taligent, Inc.: *See*—
Marsh, Donald M.; and Zias, Jeff, 5,487,145, Cl. 395-162.000.

Tamagawa Seiki Kabushiki Kaisha: *See*—
Masaki, Koichi; Fukuzawa, Yoshinao; Kitazawa, Kanji; Azuma, Takanobu; Naganuma, Naohiro; and Hosoda, Tetsuo, 5,486,731, Cl. 310-180.000.

Tamura, Akihiko: *See*—
Fujii, Yozo; Moriguchi, Hiroyuki; Ikunami, Yoshikazu; Matsunawa, Masahiko; Tamura, Akihiko; Yasuda, Kazuo; Miwa, Tadashi; Horiuchi, Tatsumi; Kishimoto, Tadao; Fujimaki, Yoshihide; Takagiwa, Hiroyuki; and Tamura, Takashi, 5,486,898, Cl. 355-200.000.

Tamura, Shin-Ichiro: *See*—
Iwamura, Takashi; Matsuzawa, Yoko; and Tamura, Shin-Ichiro, 5,486,437, Cl. 369-288.000.

Tamura, Takashi: *See*—
Fujii, Yozo; Moriguchi, Hiroyuki; Ikunami, Yoshikazu; Matsunawa, Masahiko; Tamura, Akihiko; Yasuda, Kazuo; Miwa, Tadashi; Horiuchi, Tatsumi; Kishimoto, Tadao; Fujimaki, Yoshihide; Takagiwa, Hiroyuki; and Tamura, Takashi, 5,486,898, Cl. 355-200.000.

Tanaami, Hideyuki: *See*—
Miura, Yasushi; Moriguchi, Haruhiko; Murayama, Yasushi; and Tanaami, Hideyuki, 5,486,849, Cl. 347-18.000.

Tanaka, Eiichiro: *See*—
Takimoto, Akio; Wakemoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, 5,486,442, Cl. 430-78.000.

Tanaka, Kuninobu: *See*—
Maekawa, Itaru; Ohgihara, Takahiro; and Tanaka, Kuninobu, 5,486,787, Cl. 327-560.000.

Tanaka, Motoharu: *See*—
Watada, Atsuyuki; Tokita, Toshiaki; and Tanaka, Motoharu, 5,487,046, Cl. 369-13.000.

Tanaka, Shigeo, to Sony Corporation. Audio visual system with automatic closing of a bus circuit when an AV unit is disconnected. 5,486,877, Cl. 348-722.000.

Tanaka, Tadao: *See*—
Suzuki, Hidekazu; Harara, Mitsuhiko; and Tanaka, Tadao, 5,487,007, Cl. 364-424.050.

Tanaka, Tetsuya; and Taniguchi, Takashi, to Matsushita Electric Industrial Co., Ltd. Cache lock information feeding system using an address translator. 5,487,162, Cl. 395-472.000.

Tanaka, Yasuhiko: *See*—
Takenouchi, Tomoo; Ichinomiya, Yoshiaki; Ishizaka, Junji; Itagaki, Junji; Ohhashi, Shuzo; Azuma, Tsukasa; and Tanaka, Yasuhiko, 5,487,082, Cl. 373-42.000.

Tanaka, Yoichiro; Tanimoto, Kazushi; Ohashi, Hiroshi; Hikosaka, Takashi; Ohtsubo, Yasuo; and Hoshina, Shigeru, to Kabushiki Kaisha Toshiba. Magnetic disk memory system. 5,486,967, Cl. 360-113.000.

Tanaka, Yoshiaki: *See*—
Takenaka, Eiji; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Sugiyama, Toshihiro; Yamanaka, Tetsuo; Murakami, Eisaku; and Komatsubara, Satoru, 5,486,909, Cl. 355-259.000.

Tanase, Yoshi: *See*—
Shamouilian, Shamouil; and Tanase, Yoshi, 5,486,975, Cl. 361-234.000.

Tang, Regianld T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundanbhai M., to United States Surgical Corporation. Medical devices fabricated from copolymers having recurring carbonate units. 5,486,593, Cl. 528-370.000.

Tani, Tohru: *See*—
Matsuda, Takehisa; Itoh, Tetsuo; and Tani, Tohru, 5,486,547, Cl. 523-111.000.

Taniguchi, Keiji: *See*—
Wada, Takasumi; Taniguchi, Keiji; and Yamamoto, Yoichi, 5,486,900, Cl. 355-203.000.

Taniguchi, Minoru: *See*—
Kakizaki, Shinobu; Taniguchi, Minoru; and Kanai, Fukashi, 5,487,006, Cl. 364-424.050.

Taniguchi, Naohiro: *See*—
Nohara, Kazuya; and Taniguchi, Naohiro, 5,485,749, Cl. 73-517.340.

Taniguchi, Takashi: *See*—
Tanaka, Tetsuya; and Taniguchi, Takashi, 5,487,162, Cl. 395-472.000.

Tanimoto, Kazushi: *See*—
Tanaka, Yoichiro; Tanimoto, Kazushi; Ohashi, Hiroshi; Hikosaka, Takashi; Ohtsubo, Yasuo; and Hoshina, Shigeru, 5,486,967, Cl. 360-113.000.

Tanner, Scott B.: *See*—
Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; Kojima, Shin-ichi; Minney, Jack L.; Oishi, Motohiro; Fukumura, Keiji; and Nakanishi, H., 5,487,038, Cl. 365-191.000.

Tanoie, Kunihiro: *See*—
Komazaki, Tomokazu; Gunji, Katsuhiko; Noguchi, Kazushige; and Tanoie, Kunihiro, 5,486,799, Cl. 333-134.000.

Taroni, Gianbattista: *See*—
Broussard, Fabio; Adovasio, Mauro; Callierotti, Corrado; Taroni, Gianbattista; and Roncalli, José, 5,486,613, Cl. 546-181.000.

Tarte, Lisa A.: *See*—
Contolini, Robert J.; Mayer, Steven T.; and Tarte, Lisa A., 5,486,234, Cl. 216-91.000.

Taruya, Masaaki: *See*—
Shimizu, Takeshi; Taruya, Masaaki; Murata, Shigemi; Koiwa, Mitsuru; and Maekawa, Toshio, 5,485,825, Cl. 123-634.000.

Tate, Takao: *See*—
Hirose, Katsuhiko; Tate, Takao; Nakamura, Norihiko; Sato, Takeshi; Iwahashi, Kazuhiro; Kamoshita, Shinji; and Yamanaka, Akihiro, 5,485,822, Cl. 123-501.000.

Taylor, Glen D., to Eaton Corporation. AC powered electrical control device with logic level control. 5,486,972, Cl. 361-154.000.

Taylor, H. Roy: *See*—
Santhouse, Daniel; and Taylor, H. Roy, 5,485,829, Cl. 126-409.000.

Taylor, Patrick R.; and Pirzada, Shahid A., to Idaho Research Foundation. Plasma production of ultra-fine ceramic carbides. 5,486,675, Cl. 217-121.590.

Taylor, Robert D.; and Andros, Marc R., to Morton International, Inc. Extrudable gas generant for hybrid air bag inflation system. 5,486,248, Cl. 149-109.600.

Technomarket, L.P.: *See*—
Beiswenger, John L.; and Schwimmer, Robert I., 5,487,053, Cl. 368-69.000.

Tedford, Clark E.: *See*—
Durant, Graham J.; Khan, Amin M.; and Tedford, Clark E., 5,486,526, Cl. 514-319.000.

Teijin Limited: *See*—

Emi, Shingo; Suzuki, Kyoji; and Ikada, Yoshito, 5,486,606, Cl. 536-84.000.
Hirata, Masumi; Funakoshi, Wataru; and Sasaki, Katsushi, 5,486,555, Cl. 524-83.000.
Tektronix, Inc.: *See*—
Seckora, Michael C., 5,487,023, Cl. 364-724.130.
Telefonaktiebolaget LM Ericsson: *See*—
Eriksson, Karl O., 5,486,784, Cl. 327-165.000.
Hansson, Hans M., 5,487,182, Cl. 455-90.000.
Lundh, Peter C. B., 5,486,113, Cl. 439-61.000.
Nordstrand, Ingrid V.; and Bodin, Stig R., 5,487,071, Cl. 370-110.100.
Persson, Bengt Y., 5,487,174, Cl. 455-33.200.
Telford, Julia H.: *See*—
Holt, Christopher B.; and Telford, Julia H., 5,486,373, Cl. 426-565.000.
Telschow, Jeffrey E., to Akzo Nobel NV. Process for preparing bis(pentaerythritol phosphate alcohol) alkylphosphonate. 5,486,639, Cl. 558-74.000.
Telschow, Jeffrey E., to Akzo Nobel NV. Process for preparing bis(pentaerythritol phosphate alcohol) alkylphosphonate. 5,486,640, Cl. 558-74.000.
Temme, Leonard A.: *See*—
Stevens, David E.; and Temme, Leonard A., 5,486,821, Cl. 340-970.000.
Teng, Ganghui: *See*—
Gordon, James N.; and Teng, Ganghui, 5,486,397, Cl. 428-76.000.
Tenmoku, Kenji; Inoue, Takuya; and Hashimoto, Takeo, to Sumitomo Electric Industries, Ltd. Optimum route determination. 5,486,822, Cl. 340-995.000.
Tenney, Joel D.: *See*—
Winters, John R.; Gray, John M.; and Tenney, Joel D., 5,486,344, Cl. 423-477.000.
Teraji, David G.: *See*—
Ludwig, George A.; and Teraji, David G., 5,486,730, Cl. 310-156.000.
Teraoka, Masao, to Tochigi Fugi Sangyo Kabushiki Kaisha. Continuously variable transmission. 5,485,725, Cl. 60-491.000.
Terhorst, Mark A. Carpet cutting knife guide. 5,485,676, Cl. 30-294.000.
Ternes-Burton Company: *See*—
Ternes, Gretchen, 5,485,679, Cl. 33-623.000.
Ternes, Gretchen, to Ternes-Burton Company. Image registration board and compressible pin assembly. 5,485,679, Cl. 33-623.000.
Tessari, Pino: *See*—
Gorza, Roberto; Gallina, Luca; and Tessari, Pino, 5,485,688, Cl. 36-117.000.
Teva Pharmaceutical Industries, Ltd.: *See*—
Sterling, Jeff; Levy, Ruth; Veinberg, Alex; Goldenberg, Willy; Finberg, John; Youdim, Musa; and Gutman, Arieh, 5,486,541, Cl. 514-657.000.
Texas Instruments Incorporated: *See*—
Andresen, Bernhard H.; and Cline, Roger A., 5,487,093, Cl. 375-376.000.
Carpenter, Alton D.; and Segler, Howard W., 5,485,672, Cl. 29-841.000.
Charboneau, Thomas J.; Strott, Douglas B.; Sogge, Dale R.; and Maher, Thomas R., 5,486,976, Cl. 361-283.400.
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Simpson, Richard; Oakland, Erick D.; and Barr, Graham M., 5,487,022, Cl. 364-715.040.
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Th. Goldschmidt AG: *See*—
Hahn, Günter; Klein, Klaus-Dieter; and Schäfer, Dietmar, 5,486,634, Cl. 556-425.000.
The, Siang-Chun: *See*—
Park, Chin S.; Holler, Mark A.; Diamond, Jay M.; The, Siang-Chun; Santoni, Umberto; and Buckmann, Kenneth R., 5,487,133, Cl. 395-27.000.
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Thetford, Dean; and Gregory, Peter, to Zeneca, Limited. Poly-substituted phthalocyanines. 5,486,274, Cl. 204-157.500.
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Thibault, William C., to AER Energy Resources, Inc. Diffusion vent for a rechargeable metal-air cell. 5,486,429, Cl. 429-27.000.
Thiel, Rudolf; Klimt, Ulrich; and Doell, Andreas, to ITT Automotive Europe GmbH. Floating-frame spot-type disc brake for high-torque automotive vehicles. 5,485,899, Cl. 188-73.100.
Thiem, Hans-Jürgen: *See*—
Eichenauer, Herbert; Piejko, Karl-Erwin; Bunte, Hans-Jürgen; and Thiem, Hans-Jürgen, 5,486,583, Cl. 526-68.000.
Thomas J. Lipton Co., Division of Conopco, Inc.: *See*—
Fischer, Craig D., deceased; Breitbart, Dennis J.; Epstein, Arnold I.; and Zabel, Dale D., 5,486,374, Cl. 426-574.000.
Thomas, Prakash: *See*—
Collier, John P.; Hogle, Richard; Marsh, James G.; and Thomas, Prakash, 5,485,736, Cl. 72-47.000.
Thomas, Royston M.: *See*—
Bernstein, Peter R.; Shaw, Andrew; Thomas, Royston M.; Veale, Chris A.; Warner, Peter; and Wolanin, Donald J., 5,486,529, Cl. 514-335.000.
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Thompson, Ralph J.; and Kane, Daniel E., to United Technologies Corporation. Turbine shroud segment with serpentine cooling channels. 5,486,090, Cl. 415-173.100.
Thompson, Terry L., to J Star Consolidated. Process and apparatus for handling a vehicle frame. 5,486,083, Cl. 414-607.000.
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Filliman, Paul D.; Ersoz, Nathaniel H.; Saeger, Timothy W.; Duffield, David J.; and Horlander, Karl F., 5,486,871, Cl. 348-558.000.
George, John B., 5,486,741, Cl. 315-382.000.
Helfrich, Kenneth J.; Stephens, Joseph C.; McClain, Kevin E.; and Lee, Brian, 5,486,866, Cl. 348-500.000.
Thomson-CSF: *See*—
Aigrain, Pierre, 5,486,938, Cl. 359-72.000.
Dagnac, Pierre; Leviandier, Michel; and Tigneres, Jean-Philippe, 5,486,681, Cl. 219-400.000.
Potier, Eric; and Wybierala, Michel, 5,486,829, Cl. 342-40.000.
Thomson Saginaw Ball Screw Company, Inc.: *See*—
Lange, David A., 5,485,760, Cl. 74-459.000.
Thorburn, William G.: *See*—
Mitchell, Donald K.; and Thorburn, William G., 5,486,923, Cl. 356-356.000.
Thorn, Richard P., to Lord Corporation. Adjustable, lockable damper. 5,486,056, Cl. 403-322.000.
Thottathil, Paul: *See*—
Kerr, Richard C.; Damewood, John R.; Menzel, Jill; Thottathil, Paul; and Sanduja, Mohan L., 5,486,210, Cl. 8-115.660.
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Dagnac, Pierre; Leviandier, Michel; and Tigneres, Jean-Philippe, 5,486,681, Cl. 219-400.000.
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Devore, David D.; Timmers, Francis J.; Stevens, James C.; and Rosen, Robert K., 5,486,632, Cl. 556-11.000.
Timms, Colin T.: *See*—
Lintott, Edward R.; and Timms, Colin T., 5,485,823, Cl. 123-506.000.
Timms, Peter L.: *See*—
Smith, James R.; and Timms, Peter L., 5,486,340, Cl. 423-240.00S.
Tindell, Runyon H., to Northrop Grumman Corporation. Slotted cowl inlet lip for introducing high pressure air. 5,485,975, Cl. 244-53.00B.
Tochigi Fugi Sangyo Kabushiki Kaisha: *See*—
Teraoka, Masao, 5,485,725, Cl. 60-491.000.
Toda, Atsushi: *See*—
Yamashita, Masayasu; and Toda, Atsushi, 5,486,740, Cl. 315-308.000.
Toda, Toshimasa; Naito, Satoru; Osawa, Hisayu; and Yamazaki, Takaaki, to Sankyo Company, Limited. Polymer composition containing a piperidyltriazine compound. 5,486,556, Cl. 524-100.000.
Todaka, Yoshihiro: *See*—
Shiokawa, Junji; Chiba, Hiroshi; Murakami, Toshio; Todaka, Yoshihiro; Ohsaka, Ichiro; and Azumi, Takashi, 5,486,860, Cl. 348-354.000.
Todd, John H.; and Shaw, James M., to Ocean Arks International, Inc. Ecological fluidized bed method for the treatment of polluted water. 5,486,291, Cl. 210-602.000.
Todd, Robert E., to Cedardell Limited. Security arrangement. 5,486,812, Cl. 340-539.000.
Tokai Kogyo Co., Ltd.: *See*—
Arima, Hidetoshi, 5,486,325, Cl. 264-167.000.
Tokita, Toshiaki: *See*—
Watada, Atsuyuki; Tokita, Toshiaki; and Tanaka, Motoharu, 5,487,046, Cl. 369-13.000.
Tokyo Buhin Kogiyo Co., Ltd.: *See*—
Akima, Hideo; Ishikura, Yoshikiyo; and Kishi, Takaaki, 5,485,901, Cl. 188-164.000.
Tolendano, Jacob M., to Aristo International Corporation. Lunch box. 5,485,921, Cl. 206-545.000.
Tomaszewski, Peter R.: *See*—
Jordan, Richard C.; Capowski, Robert S.; Casper, Daniel F.; Ferraiolo, Frank D.; Laviola, William C.; and Tomaszewski, Peter R., 5,487,095, Cl. 376-371.000.
Tomlin, Anthony S.: *See*—

Henderson, John A.; Tomlin, Anthony S.; and Lucas, David M., 5,486,569, Cl. 525-116.000.

Tomoegawa Paper Co., Ltd.: *See*—
Fujikake, Hideo; Takizawa, Kuniharu; Hirose, Juichi; and Kobayashi, Tatsushi, 5,486,936, Cl. 359-51.000.

Tomura, Yoshihiro; and Bessho, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Capillary for a wire bonding apparatus and a method for forming an electric connection bump using the capillary. 5,485,949, Cl. 228-180.500.

Tong, Franklin F.: *See*—
Choy, Michael M.; Green, Paul E., Jr.; Hall, William E.; Janniello, Frank J.; Kravitz, Jeff K.; Liu, Karen; Ramaswami, Rajiv; and Tong, Franklin F., 5,487,120, Cl. 385-24.000.

Toon, Donald A.; Nielsen, Per H.; and Skov, Bent, to Solinst Canada Limited. Groundwater sampler. 5,485,881, Cl. 166-165.000.

Topholm & Westermann APS: *See*—
Topholm, Jan; Andersen, Svend V.; and Westermann, Soren E., 5,487,012, Cl. 364-474.050.

Topholm, Jan; Andersen, Svend V.; and Westermann, Soren E., to Topholm & Westermann APS. Method of preparing an otoplasty or adaptive earpiece individually matched to the shape of an auditory canal. 5,487,012, Cl. 364-474.050.

Toppan Printing Co., Ltd.: *See*—
Shindo, Naoaki; Kita, Takehide; Matsudaira, Nagahisa; Kobayashi, Akihiko; Tada, Yoshiaki; Sato, Takashi; and Sato, Atsushi, 5,486,933, Cl. 359-2.000.

Toro Company, The: *See*—
Walto, Joseph J.; Friberg, Nathan J.; and Niskanen, Floyd D., 5,485,963, Cl. 239-663.000.

Tosaka, Yasuo; and Sasagawa, Masayuki, to Konica Corporation. Silver halide color photographic light sensitive material and the image-forming process thereof. 5,486,450, Cl. 430-538.000.

Toshiba America Information Systems, Inc.: *See*—
Comer, Keith; Elsasser, Gary; and Iwakiri, Takano, 5,486,846, Cl. 345-168.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Katsumata, Hirofumi, 5,486,105, Cl. 425-143.000.

Total Register, Inc.: *See*—
Gallagher, John E.; and Gallagher, Terence J., 5,486,254, Cl. 156-229.000.

Totsuka, Nobuo: *See*—
Hashiguchi, Koichi; Matsumoto, Yoshihiro; Imanaka, Makoto; Hira, Takaaki; Ikeda, Rinsei; Nishiyama, Naoki; Totsuka, Nobuo; Bekki, Yoichiro; and Nabae, Motohiro, 5,486,243, Cl. 148-552.000.

Tougane, Hikohiro: *See*—
Igarashi, Osamu; Naitou, Akira; Tougane, Hikohiro; Tsutsumi, Hironobu; and Kudou, Tosihisa, 5,486,803, Cl. 336-92.000.

Touhsaent, Robert E.: *See*—
McGee, Dennis E.; and Touhsaent, Robert E., 5,486,426, Cl. 428-516.000.

Towbin, Harry: *See*—
Gordon, Julian; Hawkes, Richard; Niday, Evelyn; and Towbin, Harry, 5,486,452, Cl. 435-5.000.

Townsend, Carl W.; and Purer, Edna M., to Hughes Aircraft Company. Accelerated extraction of rolled materials. 5,486,236, Cl. 134-13.000.

Townsend, Donald J.: *See*—
Song, Joo H.; and Townsend, Donald J., 5,486,366, Cl. 426-5.000.

Townsend, Laurace E., to Wayne State University. Method and test kits for identifying Alzheimer's disease by testing cerebrospinal fluid. 5,486,460, Cl. 435-40.510.

Toya, Masumi, to Casio Computer Co., Ltd. Data processing apparatus for obtaining pattern-image data. 5,487,140, Cl. 395-135.000.

Toyama, Noboru: *See*—
Nakagawa, Katsumi; and Toyama, Noboru, 5,486,238, Cl. 136-259.000.

Toyne, Kenneth J.: *See*—
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Samra, Amarjit K., 5,486,309, Cl. 252-299.600.

Toyoda Koki Kabushiki Kaisha: *See*—
Asano, Hiroaki; Kobayashi, Yasuhiro; Hotta, Shigeo; Yamakawa, Yoichi; Ito, Akira; and Sugiura, Hirotaka, 5,485,752, Cl. 73-660.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Hamajima, Kaneo, 5,486,573, Cl. 525-274.000.
Hirose, Katsuhiko; Tate, Takao; Nakamura, Norihiko; Sato, Takeshi; Iwahashi, Kazuhiro; Kamoshita, Shinji; and Yamanaka, Akihiro, 5,485,822, Cl. 123-501.000.
Ohata, Akira; and Sawada, Hiroshi, 5,485,826, Cl. 123-679.000.
Ota, Hitoshi; Yashiro, Masao; Yotsuya, Koki; Kako, Takuzo; and Nakashima, Yuzi, 5,486,338, Cl. 422-179.000.

Toyota, Katsuhiro: *See*—
Yamashita, Yuji; and Toyota, Katsuhiro, 5,486,646, Cl. 84-635.000.

Toyota Motor Company: *See*—
Fuwa, Yoshio; Saitou, Kouji; and Yamashita, Jiro, 5,486,299, Cl. 252-12.000.

Trachte, Dietrich: *See*—
Treiber, Juergen; Kuehn, Michael; Rollwage, Mathias; Trachte, Dietrich; and Strohl, Willi, 5,486,087, Cl. 415-55.100.

Tran, Phieu M.: *See*—
Smolinske, Jeffrey C.; Tran, Phieu M.; Clanton, Christopher L.; and Scheibel, Robert C., Jr., 5,487,068, Cl. 370-94.100.

Tranquillini, Maria E.: *See*—
Trist, David; Pentassuglia, Giorgio; Tranquillini, Maria E.; and Ursini, Antonella, 5,486,514, Cl. 514-221.000.

Treiber, Juergen; Kuehn, Michael; Rollwage, Mathias; Trachte, Dietrich; and Strohl, Willi, to Robert Bosch GmbH. Unit for delivering fuel from a supply tank to an internal combustion engine. 5,486,087, Cl. 415-55.100.

Trent, David L.: *See*—
Quarderer, George J., Jr.; Swisher, Curtis N.; and Trent, David L., 5,486,627, Cl. 549-521.000.

Tribology Systems, Inc.: *See*—
Sibley, Lewis B.; and Kelly, C. Brian, 5,486,052, Cl. 384-463.000.

Trimble Navigation Limited: *See*—
Lennen, Gary R., 5,486,834, Cl. 342-357.000.

Trist, David; Pentassuglia, Giorgio; Tranquillini, Maria E.; and Ursini, Antonella, to Glaxo SpA. Carbamate derivatives. 5,486,514, Cl. 514-221.000.

Trodden, Thomas J., to Philips Electroics North America Corporation. Sense amplifier having variable sensing load for non-volatile memory. 5,487,045, Cl. 365-205.000.

Troudet, Farideh; and Troudet, Terry. Autonomous wearable computing device and method of artistic expression using same. 5,486,112, Cl. 434-250.000.

Troudet, Terry: *See*—
Troudet, Farideh; and Troudet, Terry, 5,486,112, Cl. 434-250.000.

Troudt, Kevin J. Universal paint sprayer extender. 5,485,960, Cl. 239-532.000.

Truax, Daniel A., to Ultra-Technologies, Inc. Method and apparatus for treatment of asphalt and synthetic resins. 5,486,554, Cl. 524-71.000.

Trustees of Boston University, The: *See*—
Oppenheim, Frank G.; and Xu, Tao, 5,486,503, Cl. 514-2.000.

Trustees of Columbia University, The: *See*—
Ghandour, Osman A., 5,486,264, Cl. 156-635.100.

Trustees of Columbia University in the City of New York, The: *See*—
Acampora, Anthony S.; and Naghshineh, Mahmoud, 5,487,065, Cl. 370-60.100.

TRW Inc.: *See*—
Lammert, Michael D., 5,486,483, Cl. 437-39.000.

TRW Vehicle Safety Systems Inc.: *See*—
Brown, Louis R.; Steffens, Charles E., Jr.; Kroetsch, Charles E.; and Robbins, Delmar H., 5,485,758, Cl. 73-865.800.
Steffens, Charles E., Jr., 5,485,970, Cl. 242-374.000.

Tsai, Chia S.; and Chang, Tien C., to Taiwan Semiconductor Manuf. Company. Method for improving the adhesion of a deposited metal layer. 5,486,266, Cl. 156-657.100.

Tsai, Kuo-Lih: *See*—
Dye, James L.; Ellaboudy, Ahmed S.; and Tsai, Kuo-Lih, 5,486,225, Cl. 75-351.000.

Tsai, Margaret C.: *See*—
Rubscha, Robert F.; and Tsai, Margaret C., 5,486,911, Cl. 355-329.000.

Tsai, Wen-Hung, to Kabushiki Kaisha Toshiba. Keyboard system capable of allowing single-hand input operation. 5,486,823, Cl. 341-22.000.

Tsay, Donny; and Motoyama, Tetsuro, to Ricoh Company, Ltd.; and Ricoh Corporation. Standard page description language cleartext structure generator. 5,487,165, Cl. 395-600.000.

Tseng, Cheng-Tzu. Sanitary chopping plate structure. 5,485,937, Cl. 220-571.000.

Tseng, Chuen-Ing J., to Lonza Inc. Low foam branched alkyldimethylamine oxides. 5,486,315, Cl. 252-547.000.

Tsuchiya, Takashi; and Ishii, Osamu, to Sony Corporation. Powder beam etching machine. 5,486,128, Cl. 451-2.000.

Tsuda, Masao: *See*—
Suzuki, Nobuhiro; Kitada, Chieko; and Tsuda, Masao, 5,486,472, Cl. 435-240.270.

Tsuji, Toshihiko; Takeuchi, Seiji; Miyazaki, Kyoichi; Yoshii, Minoru; Nose, Noriyuki; and Mori, Tetsuzo, to Canon Kabushiki Kaisha. Inspection method and apparatus for inspecting a particle, if any, on a substrate having a pattern. 5,486,919, Cl. 356-349.000.

Tsumura, Tomohiko: *See*—
Matsumoto, Kimio; Sawaike, Ichihiro; Nishigakik, Atsuo; Yamashita, Akitoshi; and Tsumura, Tomohiko, 5,485,897, Cl. 187-399.000.

Tsuneeda, Kenichi; Yoshida, Sachiko; and Ogasawara, Masato, to Kabushiki Kaisha Toshiba. Contact charger and image forming apparatus comprising the same. 5,486,906, Cl. 355-219.000.

Tsunekawa, Tokuichi: *See*—
Suzuki, Kenji; Ishizaki, Akira; Ohtaka, Keiji; Suda, Yasuo; Fukahori, Hidehiko; Nagano, Akihiko; Konishi, Kazuki; and Tsunekawa, Tokuichi, 5,486,892, Cl. 354-402.000.

Tsurumaru, Shinichiro, to Fujitsu Limited. Printer-containing apparatus. 5,486,062, Cl. 400-618.000.

Tsurumi, Mitsuyuki: *See*—
Matushita, Tetunori; Kamikawa, Hiroshi; Satoh, Hiroshi; Nomura, Kimiatus; and Tsurumi, Mitsuyuki, 5,486,446, Cl. 430-156.000.

Tsutsumi, Hironobu: *See*—
Igarashi, Osamu; Naitou, Akira; Tougane, Hikohiro; Tsutsumi, Hironobu; and Kudou, Tosihisa, 5,486,803, Cl. 336-92.000.

Tsutsumi, Yousuke: *See*—
Itagaki, Akinari; Azechi, Syuuichi; Kuwata, Satoshi; Tsutsumi, Yousuke; and Kodaiku, Masanori, 5,486,549, Cl. 523-161.000.

Tucker, Gary D. Lollipop dispenser apparatus. 5,485,939, Cl. 221-86.000.

Tuggle, Lloyd H.; and Warfel, Paul A., to WCI Outdoor Products, Inc. Reserting ignition switch for a gasoline powered chain saw. 5,485,814, Cl. 123-179.500.
Turner, Charles H.: *See*—
Rowland, Landon L.; Lowsley, Richard K.; Dyer, Lester W.; and Turner, Charles H., 5,486,831, Cl. 342-62.000.
Tuttle, John R.; and Tuttle, Mark E., to Micron Communications, Inc. Method of producing button-type batteries and spring-biased concave button-type battery. 5,486,431, Cl. 429-66.000.
Tuttle, Mark E.: *See*—
Tuttle, John R.; and Tuttle, Mark E., 5,486,431, Cl. 429-66.000.
Twomey, Michael F.: *See*—
Ranganathan, Ramachandran S.; Marinelli, Edmund R.; Pillai, Radhakrishna; and Twomey, Michael F., 5,486,349, Cl. 424-9.363.
Tyler, John G.: *See*—
Dinallo, Chris A.; Kovel, Michael J.; Lawson, William W.; Paulat, Martin J., Jr.; Tyler, John G.; Winners, Scott L.; and Allman, Gary G., 5,487,167, Cl. 395-650.000.
Tyner, Jeffrey D. Portable fabric covered divider panels. 5,486,391, Cl. 428-44.000.
Tyson, Glenn M., to GTY Industries. Lighting system. 5,486,988, Cl. 362-267.000.
Tzikas, Athanassios: *See*—
Dietz, Rolf; and Tzikas, Athanassios, 5,486,000, Cl. 536-634.000.
Ubert, Harald: *See*—
Koether, Bernard; Koether, George F., II; and Ubert, Harald, 5,485,780, Cl. 99-419.000.
Uchibori, Takanobu, to Kabushiki Kaisha Toshiba. Doppler-type ultrasonic diagnostic apparatus. 5,485,844, Cl. 128-661.000.
Uchida, Haruo, to Canon Kabushiki Kaisha. Ink jet recording apparatus. 5,486,854, Cl. 347-30.000.
Uchiyama, Yuji: *See*—
Sugioka, Ichiro; Suzuki, Tetsuji; Koyama, Fujiko; Uchiyama, Yuji; Ikeda, Hiroyuki; Komeo, Toshio; Takahashi, Ryosuke; and Shou, Toshiaki, 5,486,878, Cl. 348-757.000.
Uki, Yoshiaki; Nishida, Yoko; and Ogawa, Yasuaki, to TAKEDA Chemical Industries Ltd. Cyclodextrin composition. 5,486,508, Cl. 514-58.000.
Udagawa, Masaharu: *See*—
Yuki, Koichiro; Hirai, Yoshihiko; Morimoto, Kiyoshi; Niwa, Mitsuaki; Yasui, Isao; Okada, Kenji; and Udagawa, Masaharu, 5,486,706, Cl. 257-25.000.
Ueda, Satoshi: *See*—
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Ueda, Takehiko: *See*—
Sakurai, Yukihiro; and Ueda, Takehiko, 5,486,995, Cl. 363-98.000.
Ueki, Katsuji; and Endo, Toyokazu, to Kasai Kogyo Co., Ltd. Automotive door trim and method for fabricating the same. 5,486,329, Cl. 264-273.000.
Ueta, Motonou; and Hayashi, Tetsuya, to Sony Corporation. Digital data transfer method. 5,487,019, Cl. 364-514.00R.
Uhlir, Donald A.: *See*—
Fennner, Joseph A.; Bullock, Ronald E.; Uhlir, Donald A.; Dahl, Michael L.; and Rogelstad, Sam A., 5,486,302, Cl. 427-376.300.
Ukawa, Yuji; and Yoshida, Tatsuo, to Nihon Kohden Corporation. Non-invasive blood pressure measurement device. 5,485,838, Cl. 128-633.000.
Ullmann, Roland, to Braun Aktiengesellschaft. Beverage brewing apparatus. 5,485,778, Cl. 99-295.000.
Ultra Technologies, Inc.: *See*—
Truax, Daniel A., 5,486,354, Cl. 524-71.000.
Ultrasonic Sensing and Monitoring Systems: *See*—
Winston, Thomas R.; and Nast, John M., 5,486,170, Cl. 600-16.000.
Underwood, Alfred E.; and Underwood, Dolores M. Baseball scoop device. 5,485,994, Cl. 273-26.00R.
Underwood, Dolores M.: *See*—
Underwood, Alfred E.; and Underwood, Dolores M., 5,485,994, Cl. 273-26.00R.
Unidex Corporation: *See*—
Suzuki, Tomohiro, 5,488,797, Cl. 333-104.000.
Union Carbide Chemicals & Plastics Technology Corporation: *See*—
Shay, Gregory D.; Jenkins, Richard D.; and Barrett, David R., 5,486,567, Cl. 526-333.000.
Union Oil Company of California: *See*—
Sandiford, Burton B.; Dovan, Hoai T.; and Hutchins, Richard D., 5,486,312, Cl. 252-315.300.
Union Switch & Signal Inc.: *See*—
Brown, James P.; and Borin, Robert P., 5,485,977, Cl. 246-167.00R.
Univoyal Chemical Company, Inc.: *See*—
Brouwer, Walter G.; Dalrymple, Alan W.; Felauer, Ethel E.; and McDonald, Paul T., 5,486,521, Cl. 514-274.000.
Mishra, Anupama; and Davis, Robert A., 5,486,533, Cl. 514-383.000.
Strenk, Richard J.; and Bell, Allyn R., 5,486,610, Cl. 544-311.000.
Univoyal Chemical Ltd.: *See*—
Brouwer, Walter G.; Dalrymple, Alan W.; Felauer, Ethel E.; and McDonald, Paul T., 5,486,521, Cl. 514-274.000.
Univoyal Chemical Ltd./Law: *See*—
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Unisys Corporation: *See*—
Byers, Larry L.; De Subijana, Josuha M.; and Michaelson, Wayne A., 5,487,150, Cl. 395-375.000.
United Bakery Equipment Company: *See*—
Bastasch, Paul M.; Hanson, Randyl C.; Hill, Lucinde L.; Norton, William E.; and Schoenbuchner, Hans W., 5,485,772, Cl. 83-873.000.
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Gray, George W.; Lacey, David; Toyne, Kenneth J.; Scrowston, Richard M.; Shenouda, Ibrahim G.; Chan, Lawrence K. M.; Bradshaw, Madeline J.; Brimmell, Victoria; Constant, Jennifer; Raynes, Edward P.; Jackson, Adam; and Sastra, Amarjit K., 5,486,309, Cl. 252-299.600.
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Hong, Gary, 5,486,714, Cl. 257-321.000.
Yang, Sheng-Hsing, 5,486,482, Cl. 437-34.000.
United Parcel Service: *See*—
Sarka, Stefan, 5,487,115, Cl. 382-296.000.
United States Advanced Network, Inc.: *See*—
Richardson, Charles T., Jr.; and Austin, Kevin L., 5,487,103, Cl. 379-88.000.
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Air Force: *See*—
Duke, Steven R.; Rossien, Glenn E.; and Saganich, Richard P., 5,485,775, Cl. 89-14.300.
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Axline, Robert M., Jr.; Sloan, George R.; and Spalding, Richard E., 5,486,830, Cl. 342-43.000.
Cimadini, Robert J.; Mayer, Steven T.; and Tarte, Lisa A., 5,486,234, Cl. 216-91.000.
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Grabnick, Harvey R., 5,486,361, Cl. 424-144.100.
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De Vaan, Adrianus J. S. M., 5,486,884, Cl. 353-122.000.
Decreamer, Alain, 5,486,870, Cl. 348-556.000.
James, Shirley J., 5,486,865, Cl. 348-465.000.
Lümer, Heinz, 5,487,177, Cl. 455-67.300.
Lonting, Gerard J., 5,486,050, Cl. 366-314.000.
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Fonteyne, Diego, 5,485,952, Cl. 227-178.100.
Green, David T., 5,486,190, Cl. 606-184.000.
Mudry, Matthew; Aranyi, Ernie; and Nicholas, David A., 5,486,189, Cl. 606-171.000.
Tang, Reginald T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kandarbhai M., 5,486,593, Cl. 528-370.000.
United Technologies Automotive, Inc.: *See*—
Hill, John P., 5,486,793, Cl. 331-56.000.
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Graves, Gary A.; Parkos, Joseph J., Jr.; and Adinolfi, Robert G., 5,486,281, Cl. 205-110.000.
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University Corporation For Atmospheric Research: *See*—
Heck, Terrence F., 5,486,835, Cl. 342-359.000.
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Barber, Troy W., Jr.; Johnson, Gary W.; and O'Brien, Dennis W., 5,486,277, Cl. 204-192.150.
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Marr, J. Joesph; Krug, Edward C.; Berens, Randolph L.; and Ke, Ou-Yang, 5,486,535, Cl. 514-450.000.
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Adair, James J.; and Singh, Rajiv K., 5,485,804, Cl. 117-90.000.
West, Jon K.; and Hench, Larry L., 5,486,598, Cl. 530-338.000.
University of Illinois, Board of Trustees of the: *See*—
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Ward, Peter A.; Miyasaka, Masayuka; and Suzuki, Yasuo, 5,486,536, Cl. 514-460.000.
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Mukherjee, Anadi, 5,487,080, Cl. 372-69.000.
University of Pennsylvania, Trustees of the: *See*—
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University of Tennessee Research Corporation: *See*—
Few, Jimmy D.; and Lewis, James W. L., 5,485,720, Cl. 60-39.821.
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University of Toledo, The: *See*—
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Unterberger, Siegfried: *See*—
Oestreich, Ulrich; Dotzer, Peter; and Unterberger, Siegfried, 5,486,378, Cl. 427-163.200.
UOP: *See*—
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Rondier, Patrick, 5,486,732, Cl. 310-232.000.
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Vancaillie, Thierry G. Self-guiding electrode and cutting tip for tissue resection. 5,486,173, Cl. 606-45.000.
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Van Der Horst, Hans, to AV Flexologic B.V. Apparatus for printing proofs. 5,485,782, Cl. 101-216.000.
Vanderspool, Jan P., II: *See*—
Nanni, Peter; Fink, Steven J.; and Vanderspool, Jan P., II, 5,487,183, Cl. 455-113.000.
Van Der Zwet, Gerardus P.: *See*—
De Jong, Krijn P.; Lednor, Peter W.; Oud, Anna E. M.; Schoonebeek, Ronald J.; Vonkeman, Koert A.; and Van Der Zwet, Gerardus P., 5,486,313, Cl. 252-373.000.
Vande Streek, Penny R.; Young, Tyrone; Weiland, Frederick L.; and Borchert, Ronald. Ventilation system for diagnostic imaging. 5,485,835, Cl. 128-205.130.
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Van Dine, C. Peter: *See*—
Carangelo, Robert M.; Dettori, Mark D.; Grigely, Lawrence J.; Murray, Terence C.; Solomon, Peter R.; Van Dine, C. Peter; and Wright, David D., 5,486,917, Cl. 356-346.000.
Van Dusen, John G.; Fuller, Timothy J.; and Hudson, Deborah M., to Xerox Corporation. Toner and developer compositions with diblock compatibilizers. 5,486,445, Cl. 430-110.000.
Van Dyk, Karl: *See*—
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Vanlaningham, Richard D.: *See*—
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VanOverloop, Ronald: *See*—
Olson, Todd; Meiser, Dan; Steed, Gary; Huffman, Eric; Otten, Matthew; VanOverloop, Ronald; Powell, Darrel; Knodell, Thomas; Rhad, Edward; Chen, Ralph; and Cook, Robert, 5,485,947, Cl. 227-176.100.
Van Rhyn, Lucas H., to Foster Wheeler Energy Corporation. Pilot probe for orbital welding apparatus. 5,486,670, Cl. 219-60.200.
Van Vranken, Brian M. Telescopic flag and cone device. 5,485,700, Cl. 52-40.000.
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Cesna, Joseph V.; and Van Woerkom, Anthony G., 5,486,131, Cl. 451-56.000.
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Glaser, Helmut F., 5,486,433, Cl. 429-164.000.
Vasconcellos, Stephen R.: *See*—
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Holland, John A., 5,485,652, Cl. 15-322.000.
Vaynshteyn, Mikhail, to Eastman Kodak Company. Variable angle flash with linear motor drive. 5,486,886, Cl. 354-149.100.
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Veenstra, Kerry, to Altera Corporation. Multiplexer structures for use in making controllable interconnections in integrated circuits.. 5,486,775, Cl. 126-38.000.
Veinberg, Alex: *See*—
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Veislinger, Bernard: *See*—
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Veitschegger, William K., to AT&T IPM Corp. Multiplanar hybrid coupler. 5,486,798, Cl. 333-116.000.
Velek, Jiff: *See*—
Procházka, Zdenko; Bláha, Ivo; Žertová, Miroslava; Slaninová, Jiřina; Velek, Jiff; Škopková, Jana; Lebl, Michal; Barth, Tomislav; Maletinská, Lenka; and Vilhardt, Hans, 5,486,596, Cl. 530-329.000.
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Ventura Traveset, Javier: *See*—
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Venturedyne, Ltd.: *See*—
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Costi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; Descombes, Jean-Jacques; and Millan, Mark. 5,486,532, Cl. 514-374.000.

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Verdonk, Edward; Greenstein, Michael; Melton, Hewlett E., Jr.; and Seyed-Bolorforosh, Mir S., to Hewlett Packard Company. Rotary encoder for intravascular ultrasound catheter. 5,485,845, Cl. 128-662.060.

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Vermillion, James H. Ski sharpening guide. 5,485,768, Cl. 76-83.000.

Vetrotex France: *See*—
Johnson, Timothy; and Moireau, Patrick. 5,486,416, Cl. 428-357.000.

Vickers, Incorporated: *See*—
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Negishi, Ichiro; Suzuki, Tetsuji; Koyama, Fujiko; Uchiyama, Yuji; Bonde, Hiroyuki; Komo, Toshio; Takahashi, Ryusaku; and Shou, Toshiaki, 5,486,878, Cl. 348-757.000.

Vidusek, David A.: *See*—
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Viner, Omri: *See*—
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McNamara, Robert P.; Saldinger, Alan; Cringle, Robert J.; Chu, Gigi C.; Sangameswara, Shanubhog G.; Vita, Peterpaul; Ouye, Michael M.; Stevens, David R. F.; Baranski, Celeste; Monsson, Cai U.; Murphy, Timothy P.; Murphy, Kevin T.; Ellis, Gary M.; and Ghate, Ranjit, 5,487,666, Cl. 370-85.200.

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VLSI Technology, Inc.: *See*—
Loos, Joann; Wang, Chao-Yuan; and Mahmood, Mossaddeg, 5,487,018, Cl. 364-489.000.

Vodiunig, Robert: *See*—
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Voege, James A.; Voege, Richard B.; and Voege, John S., 5,485,983, Cl. 251-206.000.

Vogel, Herward A.: *See*—
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Völpel, Stefan: *See*—
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Volt Information Sciences, Inc.: *See*—
Rothschild, Ralph F.; Kontopidis, George D.; and Linton, Charles C., 5,487,102, Cl. 379-67.000.

Volz, Keith L.; Renn, Robert M.; Irlbeck, Robert D.; Deak, Frederick R.; and Johnson, David C., to Whitaker Corporation. Burn-in socket testing apparatus. 5,486,771, Cl. 324-755.000.

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Vraney, Lawrence E.; Protofanousis, Michael S.; Loew, Dean R.; and van Daal, Robert W., to Motorola, Inc. Method for translating a test plan source file containing multiple programming languages. 5,487,169, Cl. 395-700.000.

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Mueller, Walter B., 5,486,387, Cl. 428-34.700.

Wachi, Shigeaki, to Sony Corporation. Optical recording medium and recording and/or reproducing apparatus using such optical recording medium. 5,487,056, Cl. 369-44.340.

Wack, Oskar K.; and Hanek, Martin, to O. K. Wack Chemie GmbH. Cleaning agent containing glycol ethers. 5,486,314, Cl. 252-542.000.

Wacoal Corp.: *See*—
Shiraiwa, Norinobu; and Kusakabe, Tatsuya, 5,485,855, Cl. 128-774.000.

Wada, Katsuo: *See*—
Shinada, Tsunetoshi; Wada, Katsuo; Inoue, Haruo; Misumi, Masaki; and Saito, Akira, 5,486,543, Cl. 521-149.000.

Wada, Takasumi; Taniguchi, Keiji; and Yamamoto, Yoichi, to Sharp Kabushiki Kaisha. Measuring device for amount of charge of toner and image forming apparatus having the measuring device. 5,486,900, Cl. 355-203.000.

Wada, Tomohisa, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device which can be programmed to indicate defective memory cell. 5,487,041, Cl. 365-200.000.

Waddington, Peter: *See*—
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Wadlington, Ben, Jr. Lever-tap-activated timed turn signaling. 5,486,809, Cl. 340-477.000.

Wadsworth, Larry B.: *See*—
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Wagar, Bruce A.: *See*—
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Wagg, Theadore J.; Clark, James K.; and Sporzynski, Robert S., to Kelsey-Hayes Company. Apparatus and method for measuring the circularity and eccentricity of a brake drum while mounted upon a vehicle. 5,485,678, Cl. 33-610.000.

Waggoner, Alan S.; Ernst, Lauren A.; and Mujumdar, Ratnakar B., to Carnegie Mellon University. Method for labeling and detecting materials employing arylsulfonate cyanine dyes. 5,486,616, Cl. 548-217.000.

Wagner, Edward D., to Wagner Electronic Products, Inc. Moisture detection circuit. 5,486,815, Cl. 340-602.000.

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Wagner, Maria: *See*—
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Wakamatsu, Kazuki: *See*—
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Wakita, Naoki: *See*—
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Walborn, Laverne A.; and Wong, Brian W. H. Battery charger with polarity sensing and timer. 5,486,750, Cl. 320-25.000.

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Naka, Shigehisa; Khan, Tasadduq; Walder, André; Marty, Michel; Delaunay, Christophe; and Thevenin, Pierre, 5,486,242, Cl. 148-422.000.

Walinsky, Paul; and Meise, William H. Cyclic coronary angioplasty system. 5,486,192, Cl. 606-194.000.

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Yagasaki, Yoichi, to Sony Corporation. Motion picture encoding system. 5,486,862, Cl. 348-399.000.

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Skinner, Donald K.; Yagi, Yoshi; and Zogg, Wilfried, 5,486,057, Cl. 400-120.020.

Yagyu, Tatsuya; and Ono, Takashi, to Orient Chemical Industries, Ltd. Trisazo dye, and aqueous ink composition containing the same. 5,486,601, Cl. 534-666.000.

Yajima, Yoshihiro: *See*—
Fusho, Yuichi; and Yajima, Yoshihiro, 5,486,467, Cl. 435-192.000.

Yamada, Junzo: *See*—
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Yamaguchi, Akira: *See*—
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Yamaguchi, Nobuyuki, to Daiwa Seiko, Inc. Reverse rotation preventive mechanism for fishing reel. 5,485,969, Cl. 242-247.000.

Yamaguchi, Shigeru: *See*—
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Yamaguchi, Susumu: *See*—
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Yamaguchi, Yukuo; Onuki, Kazuhiko; and Sugiyama, Kazuhide, to Canon Kabushiki Kaisha. Image projecting apparatus. 5,486,882, Cl. 353-77.000.

Yamaha Corporation: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Sakai, Koji, 5,486,018, Cl. 280-714.000.

Yamaji, Michio: *See*—
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Yamakawa, Yoichi: *See*—
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Yamamoto, Hiroshi; Takeyasu, Nobuyuki; and Ohta, Tomohiro, to Kawasaki Steel Corporation. Method of forming multilayered wiring structure in semiconductor device. 5,486,492, Cl. 437-192.000.

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Yamasaki, Hiroyuki: *See*—
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Yamashita, Masayasu; and Toda, Atsushi, to Koito Manufacturing Co., Ltd. Lighting circuit for vehicular discharge lamp having DC/AC converter. 5,486,740, Cl. 315-308.000.

Yamashita, Yuji; and Toyota, Katsuhiro, to Roland Corporation. Rhythm creating system for creating a rhythm pattern from specifying input data. 5,486,646, Cl. 84-635.000.

Yamauchi, Tadaaki: *See*—
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Yanagi, Junichirou; Takase, Akihiko; and Takahashi, Setsuo, to Hitachi, Ltd. Looped bus system for connecting plural nodes or plural circuit cards. 5,487,062, Cl. 370-16.100.

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Yang, Chang M.; Hong, Jong Y.; Lee, Ki W.; Lee, Byeong G.; and Chang, Dong I., to Pacific Corporation. Kojic acid derivative. 5,486,624, Cl. 549-418.000.

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Yang, Kuo-Tsung. Combination lock. 5,485,734, Cl. 70-285.000.

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Yano, Yuichi; Kinugasa, Naoki; and Takigawa, Akio, to Nippon Sheet Glass Co., Ltd. Latex containment means for a liquid crystal window. 5,486,937, Cl. 359-51.000.

Yardley, John P.; Fletcher, Horace, III; Kelly, Michael G.; and White, Alan C., to American Home Products Corporation. 4-indolylpiperazinyl derivatives. 5,486,518, Cl. 514-254.000.

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Ye, Yan; Rhoades, Charles S.; and Yin, Gerald Z., to Applied Materials, Inc. Plasma dry cleaning of semiconductor processing chambers. 5,486,235, Cl. 134-1.100.

Yetter, Karl, to Hubbell Incorporated. Partition for dividing a device box. 5,486,650, Cl. 174-53.000.

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Zapol, Warren M.; and Frostell, Claes, to General Hospital Corporation, The. Methods and devices for treating plumonary vasoconstriction and asthma. 5,485,827, Cl. 128-200.140.
Zaun, Jochim M., to Sweco, Incorporated. Centrifugal sifter and elements thereof. 5,485,924, Cl. 209-300.000.
Zdepski, Joel W., to RCA Thomson Licensing Corporation. Differential time code method and apparatus as for a compressed video signal. 5,486,864, Cl. 348-423.000.
Zdybel, Frank, Jr.; Sang, Henry W., Jr.; Pederson, Jan O.; Smith, Z. E., III; Henderson, D. A., Jr.; Hecht, David L.; and Bloomberg, Dan S., to Xerox Corporation. Hardcopy lossless data storage and communications for electronic document processing systems. 5,486,686, Cl. 235-375.000.
Zeamer, Geoffrey H. Magnetically levitated force/weight measurement system. 5,485,748, Cl. 73-862.610.
Zeneca Limited: *See*—
Bernstein, Peter R.; Shaw, Andrew; Thomas, Royston M.; Veale, Chris A.; Warner, Peter; and Wolanin, Donald J., 5,486,529, Cl. 514-335.000.
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Zeuthen, Klas, to Gerstenberg & Agger A/S. Blade system for a scraped surface heat exchanger. 5,485,880, Cl. 165-94.000.

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Spence, John R.; Gupta, Rajiv; and Zhang, Mingming, 5,486,795, Cl. 331-116.0FE.

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Zimmer, Inc.: *See*—
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Zimmerman, Harold M. Mixing auger for concrete trucks. 5,486,047, Cl. 366-50.000.

Zimmerman, Mary P.; and Smith, Robert E., to Prototek, Inc. Cysteine protease inhibitors containing heterocyclic leaving groups. 5,486,623, Cl. 549-417.000.

Zimmermann, Wolfgang: *See*—
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ZoMed International: *See*—
Lax, Ronald G.; Edwards, Stuart D.; and Sharkey, Hugh R., 5,486,161, Cl. 604-22.000.

Zommer, Nathan, to IXYS Corporation. High frequency MOS device. 5,486,715, Cl. 257-341.000.

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Cohen, Robert C.; and Zubok, Rafial, 5,486,181, Cl. 606-91.000.

Zuckerman, Andrew M., to Different Dimensions Inc. Hanger with irremovable information tab. 5,485,943, Cl. 223-85.000.

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Zurbuchen, Gregory A.: *See*—
Machmeier, Paul M.; Zurbuchen, Gregory A.; and Lemens, Paul B., 5,485,641, Cl. 7-134.000.

Zygourakis, Kyriacos; Bednarczyk, John L.; McIntyre, Bradley W.; and Glacken, Michael W., to Board of Regents, The University of Texas System. Method and apparatus for time-resolved measurements of lymphocyte function and aggregate structure using computer-automated microscopy. 5,487,112, Cl. 382-6.000.

ZymoGenetics, Inc.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23rd DAY OF JANUARY, 1996

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Apap, Marc F. C.; Thorin, Cedric L. M. C.; Rosenstatter, Otto; and Malata, Peter, to Dentalwerk Bürmoos Gesellschaft m.b.H. Dental tool holder. Re. 35,147, Cl. 433-102.000.

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Feleppa, Ernest J.: *See*—
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Lizzi, Frederic L.; Elbaum, Marek; and Feleppa, Ernest J., to Riverside Research Institute. Frequency diversity for image enhancement. Re. 35,148, Cl. 348-163.000.

Malata, Peter: *See*—
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Riverside Research Institute: *See*—
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Rosenstatter, Otto: *See*—
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Thorin, Cedric L. M. C.: *See*—
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LIST OF REEXAMINATION PATENTEES

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CERTIFICATES WERE ISSUED

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Van Gompel, James J.; and Akey, Ronald R., B1 4,756,651, Cl. 410-46.000.

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462 5,486,688
463 5,486,689

CLASS 236

49.3 5,485,953
78 R 5,485,954

CLASS 238

265 5,485,955

CLASS 239

1 5,485,956
88 5,485,957
265.19 5,485,958
265.41 5,485,959
532 5,485,960
558 5,485,961
655 5,485,962
663 5,485,963

CLASS 241

27 5,485,964
29 5,485,965
39 5,485,966

CLASS 242

18 A 5,485,967
125.2 5,485,968
247 5,485,969
374 5,485,970
381.1 5,485,971
386 5,485,972
5,485,973
525.6 5,485,974

CLASS 244

53 B 5,485,975
118.6 5,485,976

CLASS 246

167 R 5,485,977

CLASS 248

165 5,485,978
188.2 5,485,979
445 5,485,980
641 5,485,981

CLASS 250

206.1 5,486,690
221 5,486,691
223 B 5,486,692
5,486,693
236 5,486,694
261 5,486,695
288 5,486,696
305 5,486,697
332 5,486,698
345 5,486,699
363.04 5,486,700
372 5,486,701
492.21 5,486,702
492.3 5,486,703

CLASS 251

149.6 5,485,982
206 5,485,983
331 5,485,984

CLASS 252

8.6 5,486,297
5,486,298
12 5,486,299
18 5,486,300
31.5 A 5,486,301
56 S 5,486,302
89.1 5,486,303
99 5,486,304
162 5,486,305
174.15 5,486,306
174.24 5,486,307
194 5,486,308
299.60 5,486,309
299.61 5,486,310
299.66 5,486,311
315.1 5,486,312
373 5,486,313
542 5,486,314
547 5,486,315
5,486,316
549 5,486,317

CLASS 257

9 5,486,704
24 5,486,705
25 5,486,706
52 5,486,707
59 5,486,708
110 5,486,709
192 5,486,710
258 5,486,711
296 5,486,712
310 5,486,713
321 5,486,714
341 5,486,715
360 5,486,716
385 5,486,717
630 5,486,718
641 5,486,719
659 5,486,720
666 5,486,721
5,486,722
707 5,486,723

CLASS 261

112.2 5,486,318

CLASS 264

36 5,486,321
46.5 5,486,322
112 5,486,323
138 5,486,324
154 5,486,273
167 5,486,325
176.1 5,486,326
211.21 5,486,327
211.23 5,486,328
273 5,486,329
291 5,486,330
344 5,486,331
406 5,486,319
408 5,486,320
516 5,486,332
541 5,486,333

CLASS 266

87 5,485,985
280 5,485,986

CLASS 267

64.28 5,485,987

CLASS 269

21 5,485,988

CLASS 271

2 5,485,989
9.08 5,485,990
121 5,485,991
299 5,485,992

CLASS 273

1.5 A 5,485,993
26 R 5,485,994
30 5,485,995
75 5,485,996
78 5,485,997
80.2 5,485,998
162 E 5,485,999
169 5,486,000
183.1 5,486,001
184 R 5,486,002
187 R 5,486,003
260 5,486,004
292 5,486,005
301 5,486,006
374 5,486,007
410 5,486,008
424 5,486,009

CLASS 277

1 5,486,010

CLASS 280

11.2 5,486,011
5,486,012
18.1 5,486,013
79.11 5,486,014
236 5,486,015
250.1 5,486,016
711 5,486,017
714 5,486,018
730.1 5,486,019
789 5,486,020

CLASS 283

81 5,486,021
83 5,486,022

CLASS 285

258 5,486,023
294 5,486,024
319 5,486,025

CLASS 292

71 5,486,026

CLASS 294

51 5,486,027
93 5,486,028
99.2 5,486,029
113 5,486,030

CLASS 296

10 5,486,031
50 5,486,032
97.13 5,486,033

CLASS 297

272.1 5,486,034
320 5,486,035
339 5,486,036
397 5,486,037

CLASS 303

22.6 5,486,039
113.2 5,486,040

CLASS 307

10.1 5,486,724
116 5,486,725
120 5,486,726

CLASS 310

12 5,486,727
40 MM 5,486,728
90.5 5,486,729
156 5,486,730
180 5,486,731
232 5,486,732
323 5,486,733
327 5,486,734

CLASS 312

111 5,486,041
196 5,486,042
235.1 5,486,043
321.5 5,486,044
369 5,486,991
406 5,486,045
408 5,486,046

CLASS 313

414 5,486,735
440 5,486,736
634 5,486,737

CLASS 315

169.3 5,486,738
276 5,487,088
277 5,486,739
308 5,486,740
382 5,486,741

CLASS 318

254 5,486,742
439 5,486,743
560 5,486,744
561 5,486,745
569 5,486,746
811 5,486,747
5,486,748

CLASS 320

9 5,486,749
25 5,486,750

CLASS 322

86 5,486,751

CLASS 323

222 5,486,752

CLASS 324

72.5 5,486,753
96 5,486,754
110 5,486,755
127 5,486,756
174 5,486,757
5,486,758
207.2 5,486,759
262 5,486,760
303 5,486,761
5,486,762
309 5,486,763
323 5,486,764
537 5,486,765
5,486,766
715 5,486,767
718 5,486,768
751 5,486,769
754 5,486,770
755 5,486,771
769 5,486,772

CLASS 326

33 5,486,774
41 5,486,776
68 5,486,777
71 5,486,778

CLASS 327

51 5,486,779
53 5,486,780
108 5,486,781
112 5,486,782
147 5,486,783
165 5,486,784
306 5,486,785
378 5,486,786
560 5,486,787

CLASS 330

9 5,486,788
149 5,486,789
260 5,486,790
282 5,486,791

CLASS 331

10 5,486,792
56 5,486,793
115 5,486,794
116 PE 5,486,795
117 R 5,486,796

CLASS 333

104 5,486,797
116 5,486,798
134 5,486,799
193 5,486,800

CLASS 335

306 5,486,801
5,486,802

CLASS 336

92 5,486,803

CLASS 338

32 R 5,486,804

CLASS 340

310.06 5,486,805
426 5,486,806
443 5,486,807
464 5,486,808
477 5,486,809
521 5,486,810
522 5,486,811
539 5,486,812
573 5,486,814
602 5,486,815
630 5,486,816
825.16 5,486,817
870.31 5,486,818
905 5,486,819
933 5,486,820
970 5,486,821
995 5,486,822

CLASS 341

22 5,486,823
26 5,486,824
50 5,486,825
51 5,486,826
58 5,486,827
59 5,486,828

CLASS 342

40 5,486,829
43 5,486,830
62 5,486,831
70 5,486,832
204 5,486,833
357 5,486,834
359 5,486,835

CLASS 343

700 MS 5,486,836
780 5,486,837
781 R 5,486,838
786 5,486,839

CLASS 345

7 5,486,840
8 5,486,841
26 5,486,842
35 5,486,843
113 5,486,844
163 5,486,845
168 5,486,846
173 5,486,847

CLASS 347

15 5,486,848
18 5,486,849
24 5,486,850
30 5,486,854
87 5,486,855
175 5,486,856
224 5,486,857
258 5,486,851

CLASS 348

163 Re.35,148
211 5,486,852
222 5,486,853
303 5,486,858
311 5,486,859
354 5,486,860
362 5,486,861
399 5,486,862
420 5,486,863
423 5,486,864
465 5,486,865
500 5,486,866
516 5,486,867
524 5,486,868
525 5,486,869
556 5,486,870
558 5,486,871
564 5,486,872
578 5,486,873
600 5,486,874
642 5,486,875
719 5,486,876
722 5,486,877
757 5,486,878

CLASS 351

158 5,486,880
223 5,486,879

CLASS 353

34 5,486,881
77 5,486,882
120 5,486,883
122 5,486,884

CLASS 354

106 5,486,885
149.1 5,486,886
149.11 5,486,887
187 5,486,888
202 5,486,889
299 5,486,890
301 5,486,891
402 5,486,892
410 5,486,893
446 5,486,894

CLASS 355

50 5,486,895
71 5,486,896
132 5,486,897
200 5,486,898
203 5,486,899
5,486,900
208 5,486,901
5,486,902
5,486,903
215 5,486,905
219 5,486,906
5,486,907
259 5,486,909
290 5,486,908
309 5,486,910
329 5,486,911

CLASS 356

73 5,486,904
153 5,486,913
221 5,486,914
318 5,486,915
345 5,486,916
346 5,486,917
5,486,918
5,486,919
350 5,486,920
5,486,921
5,486,922
356 5,486,923
357 5,486,924
373 5,486,925
375 5,486,926

CLASS 358

298 5,486,927
299 5,486,928
320 5,486,929
335 5,486,930
5,486,931
498 5,486,932

CLASS 359

2 5,486,933
15 5,486,934
37 5,486,935
51 5,486,936
5,486,937
72 5,486,938
74 5,486,939
5,486,940
81 5,486,941
83 5,486,942
123 5,486,943
157 B1 4,282,605
198 5,486,944
216 5,486,945
263 5,486,946
341 5,486,947
462 5,486,948
498 5,486,949
565 5,486,950
5,486,951
603 5,486,952
725 5,486,953
818 5,486,954

CLASS 360

10.3 5,486,955
65 5,486,956
75 5,486,957
85 5,486,958
94 5,486,959
99.08 5,486,960
99.12 5,486,961
5,486,962
104 5,486,963
105 5,486,964
106 5,486,965
107 5,486,966
113 5,486,967
126 5,486,968
127 5,486,969
128 5,486,970
133 5,486,971

CLASS 361

154 5,486,972
170 5,486,973
234 5,486,974
5,486,975
283.4 5,486,976
529 5,486,977
617 5,486,978
640 5,486,979
697 5,486,980
704 5,486,981
728 5,486,982

CLASS 362

29 5,486,983
32 5,486,984
69 5,486,985
83 5,486,986
226 5,486,987
267 5,486,988
291 5,486,989
309 5,486,990

CLASS 363

21 5,486,992
98 5,486,993
5,486,994

CLASS 364

149 5,486,995
152 5,486,996
5,486,998
165 5,486,997
401 5,486,999
419.08 5,487,000
421 5,487,001
424.01 5,487,002
424.05 5,487,006
5,487,007
424.1 5,487,003
5,487,004
5,487,005
431.04 5,487,008
449 5,487,009
470 5,487,011
474.05 5,487,012
479 5,487,010
480 5,487,013
481 5,487,014
484 5,487,015
5,487,016
488 5,487,017
489 5,487,018
514 R 5,487,019
571.01 5,487,020
578 5,487,021
715.04 5,487,022
724.13 5,487,023
753 5,487,024
788 5,487,025
841 5,487,026
851 5,487,027

CLASS 365

51 5,487,028
145 5,487,029
5,487,030
5,487,031
5,487,032
185.18 5,487,034
185.19 5,487,033
189.02 5,487,035
189.09 5,487,036
189.11 5,487,037
191 5,487,038
200 5,487,039
5,487,040
5,487,041
201 5,487,042
203 5,487,043
5,487,044
205 5,487,045
207 5,487,048
221 5,487,049
230.06 5,487,050
233 5,487,051

CLASS 366

50 5,486,047
76.8 5,486,048
175.2 5,486,049
314 5,486,050

CLASS 367

56 5,487,052

CLASS 368

69 5,487,053
185 5,487,054

CLASS 369

13 5,487,046
32 5,487,047
44.28 5,487,055
44.34 5,487,056
107 5,487,057
112 5,487,058
116 5,487,059
118 5,487,060
288 5,486,437

CLASS 370

13 5,487,061
16.1 5,487,062
56 5,487,063
60 5,487,064
60.1 5,487,065
85.2 5,487,066
85.7 5,487,067
94.1 5,487,068
94.3 5,487,069
108 5,487,070
110.1 5,487,071

CLASS 371

20.6 5,487,073
22.3 5,487,074
32 5,487,072
37.1 5,487,075
40.1 5,487,076
5,487,077

CLASS 372

5 5,487,078
20 5,487,079
69 5,487,080

CLASS 373

9 5,487,081
42 5,487,082

CLASS 375

200 5,487,083
215 5,487,084
230 5,487,085
243 5,487,086
245 5,487,087
296 5,487,089
316 5,487,090
347 5,487,091
354 5,487,092
376 5,487,093

CLASS 376

100 5,487,094
371 5,487,095

CLASS 377

15 5,487,096
20 5,487,097

CLASS 378

19 5,487,098
57 B1 4,366,382

CLASS 379

57 5,487,100
59 5,487,099
60 5,487,101
67 5,487,102
88 5,487,103
96 5,487,104
100 5,487,105
5,487,106
144 5,487,107
211 5,487,111
220 5,487,110
355 5,487,108
410 5,487,109

CLASS 381

17 5,487,113
192 5,487,114

CLASS 382

6 5,487,112
104 5,487,116
173 5,487,117
202 5,487,118
239 5,487,119
296 5,487,115

CLASS 383

200 5,486,051

CLASS 384

463 5,486,052
513 5,486,053
610 5,486,054

CLASS 385

24 5,487,120
39 5,487,121
46 5,487,122
70 5,487,123
93 5,487,124
96 5,487,125
105 5,487,126

CLASS 392

416 5,487,127

CLASS 395

2.31 5,487,128
2.42 5,487,129
3 5,487,130
27 5,487,133
51 5,487,134
62 5,487,131
63 5,487,132
75 5,487,135
108 5,487,136
115 5,487,137
5,487,138
135 5,487,139
5,487,140
5,487,141
140 B1 5,146,550
143 5,487,142
157 5,487,143
161 5,487,144
162 5,487,145
166 5,487,146
180 5,487,147
182.02 5,487,148
182.08 5,487,149
185.02 5,487,151
200.01 5,487,152
250 5,487,153
311 5,487,155
375 5,487,156
5,487,157
5,487,158
5,487,159
441 5,487,160
442 5,487,161
472 5,487,162
550 5,487,163
600 5,487,164
5,487,165
5,487,166
650 5,487,167
5,487,168
700 5,487,169
732 5,487,170
800 5,487,172
5,487,173
840 5,487,171
842 5,487,154

CLASS 400

61 5,486,055
120.02 5,486,057
485 5,486,058
488 5,486,059
605 5,486,061
618 5,486,062
708 5,486,063

CLASS 401

201 5,486,064

CLASS 403

322 5,486,056

CLASS 404

15 5,486,065
45 5,486,066
84.05 5,486,067

CLASS 405

52 B1 5,263,794
129 5,486,068
198 5,486,069
202 5,486,070
229 5,486,071

CLASS 407

32 5,486,072
113 5,486,073

CLASS 408

77 5,486,074
230 5,486,075

CLASS 409

179 5,486,076

CLASS 410

46 B1 4,756,651
69 5,486,077
155 5,486,078

CLASS 411

392 5,486,079

CLASS 414

217 5,486,080
225 5,486,081
542 5,486,082
607 5,486,083
694 5,486,084
724 5,486,085

CLASS 415

9 5,486,086
55.1 5,486,087
121.2 5,486,088
146 5,486,089
173.1 5,486,090
194 5,486,091
225 5,486,092

CLASS 416

97 R 5,486,093
210.R 5,486,094
214 A 5,486,095
224 5,486,096

CLASS 417

222.1 5,486,097
222.2 5,486,098
477.13 5,486,099

CLASS 422

16 5,486,334
55 5,486,335
90 5,486,336
100 5,486,337
179 5,486,338
193 5,486,339

CLASS 423

240 S 5,486,340
243.01 5,486,341
5,486,342
413 5,486,343
477 5,486,344
573.1 5,486,345
594 5,486,346
623 5,486,347
700 5,486,348

CLASS 424

9.363 5,486,349
49 5,486,350
59 5,486,351
5,486,352
5,486,353
63 5,486,354
65 5,486,355
76.1 5,486,356
78.17 5,486,357
78.23 5,486,358
93.7 5,486,359
94.4 5,486,360
144.1 5,486,361
426 5,486,362
442 5,486,363
488 5,486,364
602 5,486,365

CLASS 425

142 5,486,104
143 5,486,105
145 5,486,106
190 5,486,100
192 R 5,486,101
202 5,486,102
541 5,486,103

CLASS 426

5 5,486,366
7 5,486,367
41 5,486,368
321 5,486,369
417 5,486,370
510 5,486,371
565 5,486,372
5,486,373
574 5,486,374
582 5,486,375
660 5,486,376

CLASS 427

79 5,486,377
163.2 5,486,378
212 5,486,379
248.1 5,486,380
294 5,486,381
376.3 5,486,382
446 5,486,383
493 5,486,384

CLASS 428

17 5,486,385
18 5,486,386
34.7 5,486,387
34.9 5,486,388
40 5,486,389
5,486,390
44 5,486,391
54 5,486,392
58 5,486,393
61 5,486,394
64.2 5,486,396
64.3 5,486,395
76 5,486,397
95 5,486,398
99 5,486,399
116 5,486,400
125 5,486,401
141 5,486,402
167 5,486,403
172 5,486,404
182 5,486,405
209 5,486,406
215 5,486,407
220 5,486,408
221 5,486,409
283 5,486,410
286 5,486,411
288 5,486,412
317.9 B1 4,784,904
323 5,486,413
334 5,486,414
349 5,486,415
357 5,486,416
5,486,417
397 5,486,418
5,486,419
405 5,486,420
421 5,486,421
447 5,486,422
450 5,486,423
451 5,486,424
500 5,486,425
516 5,486,426
546 5,486,427

CLASS 429

19 5,486,428
27 5,486,429
35 5,486,430
66 5,486,431
99 5,486,432
164 5,486,433
178 5,486,434
192 5,486,435

CLASS 430

11 5,486,436
58 5,486,438
59 5,486,439
62 5,486,440
74 5,486,441
78 5,486,442
106 5,486,443
109 5,486,444
110 5,486,445
156 5,486,446
197 5,486,447
328 5,486,449
538 5,486,450
569 5,486,451

CLASS 431

12 5,486,107
181 5,486,108

CLASS 433

72 5,486,109
102 Re.35,147
177 5,486,110

CLASS 434

157 5,486,111
250 5,486,112

CLASS 435

5 5,486,452
5,486,453
6 5,486,454
5,486,455
7.2 5,486,457
7.23 5,486,456
14 5,486,458
31 5,486,459
40.51 5,486,460
68.1 5,486,461
69.1 5,486,462
69.5 5,486,463
70.1 5,486,465
106 5,486,466
192 5,486,467
200 5,486,468
210 5,486,469
219 5,486,470
226 5,486,471
240.2 5,486,473
240.27 5,486,472
262 5,486,474
266 5,486,475

CLASS 436

15 5,486,476
17 5,486,477
52 5,486,478
533 5,486,479

CLASS 437

29 5,486,480
31 5,486,481
34 5,486,482
39 5,486,483
41 5,486,484
5,486,485
43 5,486,486
45 5,486,487
60 5,486,488
129 5,486,489
5,486,490
192 5,486,492
195 5,486,493
209 5,486,494

CLASS 439

61 5,486,113
62 5,486,114
108 5,486,115
347 5,486,116
357 5,486,117
374 5,486,118
489 5,486,119
521 5,486,120
652 5,486,121
752 5,486,122
825 5,486,123
843 5,486,124

CLASS 440

75 5,486,125

CLASS 445

25 5,486,126

CLASS 446

120 5,486,127

CLASS 451

2 5,486,128
5 5,486,129
11 5,486,130
56 5,486,131
75 5,486,132
150 5,486,133
209 5,486,134
326 5,486,135
347 5,486,136
540 5,486,137

CLASS 452

58 5,486,145

CLASS 454

75 5,486,138
123 5,486,139
333 5,486,140

CLASS 455

33.2 5,487,174
54.1 5,487,180
54.2 5,487,175
67.1 5,487,176
67.3 5,487,177
67.4 5,487,178
69 5,487,179
89 5,487,181
90 5,487,182
113 5,487,183
126 5,487,184
127 5,487,185
192.2 5,487,186

CLASS 472

60 5,486,141

CLASS 474

69 5,486,142
148 5,486,143

CLASS 475
179 5,486,144

CLASS 477
65 5,486,146
125 5,486,147

CLASS 482
57 5,486,148
120 5,486,149
133 5,486,150

CLASS 483
1 5,486,151

CLASS 493
468 5,486,152

CLASS 494
57 5,486,153

CLASS 501
10 5,486,495
90 5,486,496
95 5,486,497
137 5,486,491

CLASS 502
66 5,486,498
81 5,486,499

CLASS 503
227 5,486,500

CLASS 505
510 5,486,501

CLASS 512
21 5,486,502

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